

APPENDIX TO THE REPORT OF THE MINISTER OF AGRICULTURE

REPORT

OF THE

DAIRY AND COLD STORAGE COMMISSIONER

Year ending March 31, 1907

PRINTED BY ORDER OF PARLIAMENT



OTTAWA

PRINTED BY S. E. DAWSON, PRINTER TO THE KING'S MOST
EXCELLENT MAJESTY

1907

[No. 15a—1908.]

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APPENDIX

TO THE

REPORT OF THE MINISTER OF AGRICULTURE

BEING THE

REPORT OF THE DAIRY AND COLD STORAGE
COMMISSIONER

OTTAWA, March 31, 1907.

To the Honourable
The Minister of Agriculture.

SIR,—I have the honour to submit my report as Dairy and Cold Storage Commissioner for the year ending March 31, 1907.

The Report is presented in five parts, as follows:—

- Part I.—Dairying.
- Part II.—Report of the Assistant Dairy Commissioner.
- Part III.—Extension of Markets.
- Part IV.—Fruit.
- Part V.—Cold Storage

The foregoing subdivisions of the work of the branch indicate the different heads under which our work is carried on. The officers of the different divisions have certain specific duties assigned to them, but owing to the nature of the work as a whole, there is necessarily much co-operation and even overlapping. I am very pleased to be able to say that every member of the staff has shown a desire to work only for the general good of those phases of agriculture and commerce, the promotion and improvement of which the branch is charged with.

Dairying.—The active work in dairying carried on by this branch in 1906 was the operation of the four cool cheese curing rooms and the organization of cow testing associations. The records of associations, prepared by Mr. C. F. Whitley, are quoted at some length. The dairy staff has been increased by the appointment of Mr. D. M. Macpherson, whose duty it will be to watch for violations of the laws relating to the manufacture and sale of butter and cheese. Mr. Geo. H. Barr, Chief Dairy Instructor in western Ontario, and Superintendent of the Strathroy Dairy School, has also been engaged as assistant in dairying and will take up his duties about April 15.

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The Assistant Dairy Commissioner, Mr. J. C. Chapais, who resides at St. Denis (en bas), Que., is employed largely in French-speaking districts, and finds his time well occupied in attending numerous agricultural, fruit and dairy meetings, visiting cheese factory syndicates and lecturing at the St. Hyacinthe Dairy School. Mr. Chapais presents an interesting review of his year's work.

Extension of Markets.—Under the head of Extension of Markets, as the name implies, efforts are made to improve the trade in dairy produce, fruit and other food products. Believing that one of the most effective means to that end is to deliver our products to consumers at home and abroad in the best possible condition, a complete system of inspection has been established, which embraces the iced car services, the loading of perishable cargoes at Montreal and other Canadian ports, and the discharge of same at the principal ports in Great Britain. Records of temperatures of perishable produce are obtained at different stages in transit, and the information thus obtained is used to show the necessity for improvement, where faulty methods of handling are discovered. Mr. W. W. Moore, to whom is assigned the duty of supervising this inspection and compiling the data thus made available, has prepared the report on this division of our work.

Fruit.—This branch of your department deals largely with what may be termed the commercial side of the fruit industry. The chief duty assigned to the Fruit Division is the administration of the Fruit Marks Act. For this purpose a staff of 8 permanent and 9 temporary inspectors, for the active season, are employed. The compilation of a monthly fruit crop report, from May to October, involves considerable labour and requires a careful study of the situation in the fruit districts month by month. Information *re* markets, methods of marketing and instruction in box packing have all received attention. The staff of the Fruit Division has been strengthened by the appointment of M. R. Baker, B.S.A. Mr. A. McNeill, chief officer of the division, has prepared that part of the report which deals with the fruit work.

Cold Storage.—Although treated separately and recognized as a division of the branch, cold storage is closely related to the other lines of work carried on by the branch. Without the products of the dairy and the fruit farm there would not be much use for cold storage in this country. The inspection work of the Markets Division relates largely to the cold storage services and the products handled in cold storage. The work of the Cold Storage Division will be increased by the administration of the Cold Storage Act, which is reprinted with the regulations made to assist in its operation. The records of butter temperatures and quantities of produce carried in cold storage have been compiled by Mr. Moore, of the Markets Division.

PUBLICATIONS.

Since last report the following bulletins have been issued:—

No. 11. General Instructions *re* the Fruit Marks Act.

No. 12. Cow Testing Associations, with Notes on the Sampling and Testing of Milk.

A Report of the Annual Convention of the Huntingdon District Dairymen's Association.

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Before this report is ready for distribution the following additional bulletins will be available:—

- No. 13. Sweet Cream Butter.
- No. 14. Apparatus for the Determination of Water in Butter.
- No. 15. Gathered Cream for Buttermaking.
- No. 16. Cold Storage Subsidies.
- No. 17. Butter-making on the Farm.
- No. 18. Co-operation in the Marketing of Apples.
- No. 19. The Packing of Apples in Boxes and Barrels.

A map of Canada has been prepared showing the approximate location of all the cheese factories, creameries and combined factories.

ACKNOWLEDGMENTS.

I consider myself fortunate in having associated with me a particularly efficient and capable staff, without whose hearty co-operation and active interest in the work it would be impossible for me to carry on so many different lines of work successfully. Where all have done so well it is impossible to discriminate.

The branch lost an efficient member of its staff by the death of Mr. Richard Burke, Fruit Inspector for Prince Edward Island, who passed away after a severe illness in September last.

Mr. C. E. Mortureux, who was for several years connected with the Cold Storage Division, rendering excellent service, has been promoted to another position in the department.

I am indebted to Mr. Jas. White, Geographer of the Department of the Interior, for the technical work involved in the preparation of the maps included in this report and also the dairy map of the Dominion.

I am also indebted to Mr. Frank T. Shutt, Chemist, Experimental Farms, for assistance and advice on chemical questions.

I have the honour to be, sir,

Your obedient servant,

J. A. RUDDICK,

Dairy and Cold Storage Commissioner.

PART I.—DAIRYING.

THE PROGRESS OF DAIRYING IN CANADA.

ONTARIO AND QUEBEC.

Ontario and Quebec continue to produce the bulk of the cheese and butter made in Canada, and the development of the industry in these two provinces seems to have reached a point where there is not very much change in the situation from year to year, except the fluctuations due to climatic, market and other conditions. There is some multiplication of factories in both provinces, but the territory is now for the most part pretty well occupied, and new factories which are erected have to compete, as a rule, with existing ones for their supply of milk. In the Lower Lake district of Ontario there is a tendency to convert some of the cheese factories into cream-gathering creameries, and localities in which cheese factories were in operation ten years ago, but have been closed for lack of support, are now being occupied by creameries on this system. There seems to be very little tendency towards the establishment of creameries in that part of Ontario lying east of Toronto.

The present relatively high price of cheese is having a tendency to check the organization of the creamery industry in the Eastern Townships section of the province of Quebec, where, of recent years, there has been a decided preference for the manufacture of butter instead of cheese. This district has always had a reputation for making a high grade of butter, and the prices which they have been able to command for it have ruled higher than in any other part of Canada, under similar market conditions. The farmers of this district, therefore, have an advantage in making butter rather than cheese when the prices for the two articles are on an even basis.

MARITIME PROVINCES.

The dairy industry is not making much progress in the Maritime Provinces. The number of factories remains about the same in Prince Edward Island as for several years past. The production of cheese and butter during the season of 1906 showed some increase over the previous year and there is evidence that the herds are recovering from the effects of the unfavourable season in 1905. At present there seems to be some revival of interest in dairying in the island province.

The dairy industry in the province of Nova Scotia is rather declining instead of growing. There were 33 cheese and butter factories in 1900 and only 17 in 1906, the quantity of milk received in the latter year being about one-third of what it was in 1900.

Dairying shows more progress in New Brunswick. While the number of establishments for the manufacture of butter and cheese has not increased during the past 6 years, the value of the products has increased considerably. The dairy industry in New Brunswick is assisted and encouraged by expert advisers employed by the provincial Department of Agriculture.

WESTERN PROVINCES.

In the western provinces the best development is shown in Northern Alberta, which was the last of all the western provinces to engage in dairy work. There are now 41

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creameries and 8 cheese factories in that province, and the number is increasing rapidly. The government of the province of Alberta is taking an active interest in promoting the dairy industry, and a large number of the creameries are under the full control of the Dairy Commissioner for the province.

In the province of Saskatchewan there are six creameries, but no cheese factories. The creamery industry does not show much progress in the province of Saskatchewan, but there is a large quantity of dairy butter manufactured, and the probabilities are that the near future will see a considerable stimulus given to the creamery industry. The provincial Department of Agriculture renders active assistance to the dairy industry through the newly appointed Superintendent of Dairying.

There is a revival of interest in the dairy industry of the province of Manitoba. The first organization of the dairy industry in Manitoba was scarcely suited to the conditions prevailing in that province, and the failure which resulted had the effect of discouraging the farmers to some extent, but the business is now being organized along lines which are more applicable to western conditions, and a considerable growth is the result. The Department of Agriculture of the province of Manitoba have a well organized dairy department in connection with the Agricultural College, and good work is being done in this connection.

In British Columbia there are 16 creameries in operation and the business is established on a sound, healthy basis.

The combined output of the creameries and cheese factories in the western provinces, including Manitoba, Saskatchewan, Alberta and British Columbia, is not sufficient to meet the demands of the local markets, including a comparatively small quantity shipped to the Yukon and the Orient. The result is that the stocks in eastern Canada have been drawn upon to supply the demands of the trade in the west. With the present development of the country, it is not likely that the production of butter and cheese in these provinces will be equal to the local demands for some time to come.

OUTLOOK FOR PRODUCTION.

There are no indications that the total amount of cheese which will be available for export from Canada will show any material permanent increase in the near future. There may be a temporary increase as a result of the relatively high prices, but the increase in home consumption and the tendency to make butter when conditions are favourable will be sufficient to offset any increase in the production for the next few years. If the export prices for butter and cheese again assume a more even basis, there should be a considerable increase in the quantity of butter for export, which may result in decreasing the cheese output slightly. In Ontario and Quebec, which are the two provinces that really govern the supply of butter and cheese, the number of cows kept is not being increased very largely, but the movement now on foot for the improvement of dairy herds is bound to have an important influence in increasing the production of milk in the future.

CONDENSED MILK.

The manufacture of condensed milk is reported to be prosperous in Canada and shows signs of growth and development. There are only four or five establishments in operation, but several others are projected.

EXPORTS OF CANADIAN CHEESE AND BUTTER.

TABLE I.—TOTAL EXPORTS, YEARS ENDING JUNE 30.

BUTTER.			CHEESE.		
Year.	Quantity.	Value.	Year.	Quantity.	Value.
	Lbs.	\$		Lbs.	\$
1880.....	18,535,362	3,058,069	1880.....	40,368,678	3,893,366
1890.....	1,951,585	340,131	1890.....	94,260,187	9,372,212
1891.....	3,768,101	602,175	1891.....	106,202,140	9,508,800
1892.....	5,736,696	1,056,058	1892.....	118,270,052	11,652,412
1893.....	7,036,013	1,296,814	1893.....	133,946,365	13,407,470
1894.....	5,534,621	1,095,588	1894.....	154,977,480	15,488,191
1895.....	3,650,258	697,476	1895.....	146,004,650	14,253,002
1896.....	5,889,241	1,052,089	1896.....	164,689,123	13,956,571
1897.....	11,453,351	2,089,173	1897.....	164,220,699	14,676,239
1898.....	11,253,787	2,046,686	1898.....	196,703,323	17,572,763
1899.....	20,139,195	3,700,873	1899.....	189,827,839	16,776,765
1900.....	25,259,737	5,122,156	1900.....	185,984,430	19,856,324
1901.....	16,335,528	3,295,663	1901.....	195,926,397	20,696,951
1902.....	27,855,978	5,660,541	1902.....	200,946,401	19,686,281
1903.....	34,128,944	6,954,618	1903.....	229,099,925	24,712,943
1904.....	24,568,001	4,724,155	1904.....	233,980,716	24,184,566
1905.....	31,764,303	5,930,379	1905.....	215,733,259	20,300,500
1906.....	34,031,525	7,075,539	1906.....	215,834,543	24,433,169

Table I gives the total quantity and values of cheese and butter exported from Canada for the years 1890 to 1906, including the year 1880. A glance at this table reveals the fact that the large annual increase in the quantity of butter and cheese exported from Canada during the decade preceding 1900 has not been maintained of late years. There are two reasons for the apparent check in the development of the dairy industry in Canada. In the first place the country suitable for dairying in the eastern provinces began to be pretty fully occupied about the year 1900, and since that date the increase of the home consumption has considerably reduced the quantity which would otherwise have been available for export.

Tables II and III give a detailed statement of the export of cheese and butter by countries for the years 1900 to 1906, inclusive. Great Britain continues to be the only market of real consequence for Canadian dairy products. The total value of cheese shipped to countries other than Great Britain in 1900 was \$43,654, which amount was increased to \$132,261 in 1906. The value of butter thus exported for the same years was \$175,156 and \$273,536, respectively. Although the percentage increase has been considerable, the actual amount is not large enough to seriously affect the situation.

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TABLE II.—STATEMENT OF EXPORTS OF CHEESE FROM CANADA FOR THE YEARS
ENDING JUNE 30, 1900 TO 1906 INCLUSIVE.

To	1900.	1901.	1902.	1903.	1904.	1905.	1906.
	\$	\$	\$	\$	\$	\$	\$
Great Britain.....	19,812,670	20,609,361	19,620,239	24,620,004	24,099,004	20,174,211	24,300,908
Australia.....	2,622	10,418	6,862	6,913	6,247	5,411	5,350
British Africa.....	347	36	868	2,514	7,559	10,612	16,623
B. W. Indies.....	13,393	16,340	18,542	44,674	34,253	36,176	25,509
B. E. Indies.....			60	40	315	62	20
British Guiana.....	1,012	1,194	1,833	2,165	1,193	2,571	3,860
Other British Possessions.....			746	553	216		
Hong Kong.....	10			161	1,253	1,079	1,029
New Zealand.....			216	983	1,039	1,642	1,795
Newfoundland.....	16,651	16,603	20,100	21,334	21,754	35,171	30,992
Belgium.....	15	124			10	22	287
Argentina.....				14			
Cuba.....	392	211	350	331	211	102	811
China.....	987	456	1,409	1,734	1,899	2,013	2,115
Danish West Indies.....	2,515		332	2,037	1,936	2,046	2,056
France.....		465			44	700	7,203
Japan.....	551	935	821	1,076	1,609	759	775
Philippine Islands.....	170	1,112		289	100		
St. Pierre.....	153	226	158	120	356	341	875
United States.....	4,836	37,601	12,038	7,779	5,386	14,182	16,082
Dutch West Indies.....		1,754	538				
Norway & Sweden.....		103				104	994
Germany.....		12	1,179	170		364	
Bermuda.....						12,505	14,033
Dutch Guiana.....				15	23	18	13
Egypt.....				30			
Mexico.....					159	329	1,594
French West Indies.....				7			
Central America.....						80	
Holland.....							97
U. S. of Colombia.....							68
Totals.....	19,856,324	20,696,951	19,686,291	24,712,943	24,184,566	20,300,500	24,433,169

TABLE III.—DETAILED STATEMENT OF EXPORTS OF BUTTER FROM CANADA FOR THE YEARS ENDING JUNE 30, 1900 TO 1906 INCLUSIVE.

To	1900.	1901.	1902.	1903.	1904.	1905.	1906.
	\$	\$	\$	\$	\$	\$	\$
Great Britain.....	4,947,000	3,142,353	5,459,300	6,554,014	4,400,774	5,568,999	6,802,003
British West Indies.....	53,657	59,396	71,816	112,968	127,790	80,323	87,085
British Guiana	3,767	3,322	6,796	7,595	6,412	8,929	11,654
Other British Possessions.....			284	72			
Hong Kong	28						
Newfoundland.....	66,069	44,986	47,066	69,017	88,422	82,387	48,283
China.....	1,663	1,199	78	141	1,763	562	761
Cuba.....	1,62	270	243	202	796	658	285
Danish West Indies	10,074		1,581	6,077	5,858	4,473	4,560
French " "	8			1,020			
Germany.....	7,216		101	13	25,644		
Hawaii.....	1			115			
Hayti.....				38			
Japan.....	2,49	717	1,013	1,816	6,027	6,496	9,373
St. Pierre.....	23,41	39,569	27,102	28,655	26,598	21,827	17,668
United States.....	5,041	5,839	41,149	10,225	6,497	70,580	33,965
British Africa.....		300	12	133,958	16,417	4,914	2,056
Mexico.....				4,685			1,268
Brazil.....		345	1,608	9,084			
Dutch West Indies.....		5,971	2,040				
U. S. Colombia... ..		396	92	1,175	2,272	200	1,747
Australia			260	6,187			
Bermuda.....						50,482	47,045
France					14	14,440	4,155
San Domingo.....				1,351			
Holland.....					8,175	13,680	
Venezuela.....				6,240			
Belgium.....					10	116	
Central America.....					686	1,062	3,431
Corea						15	
Dutch Guiana.....						186	30
Turkey.....						50	
Porto Rico.....							170
Totals.. . . .	5,122,15	3,295,663	5,660,541	6,954,618	4,724,155	5,939,379	7,075,539

THE CHEESE INDUSTRY.

FIRST CHEESE FACTORIES.

It is now 41 years since the first Canadian cheese were shipped to Great Britain, and a few facts concerning the genesis of the present large and important trade should be interesting to all dairymen.

There are several names that will always occupy a prominent place in the annals of the early development of the cheese factory system of Canada. In Western Ontario Mr. Harvey Farrington, the pioneer cheese factory promoter, whose first factory was started in Oxford county, Ontario, in 1864, who during his lifetime laboured unselfishly to promote the welfare of the industry which his enterprise had begun, and who was always ready with advice and helpful suggestion to others proposing to follow in his footsteps, deserves a niche in the dairymen's hall of fame.

The late Mr. Edwin Caswell, the original cheese buyer of Canada, who did much to make the town of Ingersoll headquarters of the trade for many years, is well remembered for his energetic, bustling manner, his genial disposition, and his uprightness in all his business dealings. Impulsive by nature, he frequently committed errors of judgment in his dealings in cheese, which caused him heavy losses, but no one ever knew him to try to get out of a bad bargain by discovering some minor defect in the quality of the cheese he had agreed to purchase.

These two pioneers have crossed the divide and we know them no more, but happily we still have with us an associate of theirs and another pioneer in the cheese industry,

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in the person of the Hon. Thomas Ballantyne, of Stratford, Ont., an early cheese manufacturer and ever ready advocate of the industry, whose unsparing criticism and stern denunciation of wrong methods left an impress on the district through which his influence extended, which is seen to-day in the character and standing of factories which he came in contact with.

The start made in 1864 in Western Ontario was soon followed in the more eastern sections of the province. One of the best known names among the pioneers of Central Ontario was that of Mr. Ketchum Graham, of Belleville. The writer did not have the privilege of knowing Mr. Graham, but has often heard men who were his associates speak of him and his work in the highest terms. His factory 'Front of Sidney' was started in 1865.

The first factory in the province of Quebec was started by Mr. James Burnett, at Dunham, in Missisquoi county, about the same time, but the industry did not make much progress in that province until after 1880.

FIRST CHEESE EXPORTED.

To Adam Brown, Esq., the present postmaster of the city of Hamilton, must be given the credit for having arranged for the shipment of the first lot of Canadian cheese to Great Britain, and his name certainly deserves to be put on record on that account. The story is told in Mr. Brown's own words, written by request for this report.

'J. A. RUDDICK, Esq.,

HAMILTON, ONT., December 4, 1906.

'Dairy Commissioner,

'Department of Agriculture,

'Ottawa.

'DEAR SIR,—It was, I think, in 1866 that I had arranged for an extended trip to England with my family, and before going I went to Ingersoll to make contracts for a supply of cheese for my firm, Brown, Gillespie & Co., wholesale grocers, Hamilton, to supply our customers for the fall trade.

'In company with the late E. Caswell, of Ingersoll, I spent two days or more visiting the several cheese factories and smaller makers in the county of Oxford. I well remember on our driving back to Ingersoll, after having completed my purchases, saying to Mr. Caswell, "I would like nothing better to occupy a portion of my time in England than introducing Canadian cheese," but I remarked it could not be done unless we had boxes to ship them in. Of course boxes would have been got from the United States, but I wanted Canadian boxes.

'When we reached Ingersoll we happened to see the late Adam Oliver, and on telling him what we had been talking about, he promptly said, "Don't let that stop you, I will see that boxes are ready for any orders you may send over, and I will start a factory and make them." Well, soon after that, I went to England and, fortified with an open letter of introduction from my firm's bankers in London, I visited several of the leading cities in England, and, soliciting business from the largest provision dealers in those places, I sought to impress them with the excellence of Canadian cheese, and worked hard to get them to order fifty boxes, or if they would not buy at market price, to accept a consignment of fifty boxes or whatever they might name, and sell them on arrival on their merit, and I stated that my firm would not draw against shipment and would be satisfied with proceeds, so sure was I of results. I sold some and consigned some.

'I had the same story from all of them at first: "We deal in American cheese; we never heard of Canadian cheese." Of course, my answer was easy, namely, because it had not been brought to their notice. To make a long story short, I succeeded by personal visit in placing by either sale or consignment, our cheese in London, Liverpool, Wolverhampton, Shrewsbury, Bristol, and in the case of some other cities I corresponded, with good results. I declared that they would find the Canadian cheese they would receive equal to, if not better than what they styled "American." I let them know what kind of cheese Canada produces, and also opened the eyes of not a

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few when I told them that our country was ever so much larger than the United States and that Canada embraced more than half the area of North America. The cheese, when received, gave satisfaction in every case.

‘I remember that the lot for Shrewsbury arrived in time to be put on sale during one of the great Shropshire cheese fairs, which I attended, and I was proud of both quality and condition. Many orders were repeated and firms that had received on consignment, afterwards sent regular orders; such of these orders as my firm received were executed through E. Caswell, of Ingersoll, the reason for which was he was a grocer and bought his goods from my firm, and I felt it would magnify his trade by having him fill the orders. It was not very long after this that resident agents of British firms were either sent out or appointed in Canada.

‘The story I have related deals with the first Canadian cheese, as far as I know, that was shipped from Canada with “Canada” on the boxes; a few cheese may have found their way across before for aught I know, or in some way have been shipped in “United States” boxes, but this I know that the largest cheese dealers in the Kingdom on whom I called, never heard of Canadian cheese until I introduced it.

‘There was a convention of cheese men held in Ottawa, between 1886 and 1891, while I was attending to my parliamentary duties. One day during the sitting of that convention I received a message in the House of Commons, saying that I was wanted in the Railway Committee room, where the convention was being held. I was most courteously introduced by the chairman, and invited to tell the story of the first shipment of cheese from Canada to Great Britain, with the Canadian brand on the boxes. I told the story there, as I tell it to you now. I knew at the first that our cheesemakers had no reason to fear placing their cheese alongside of that from the United States, and I felt sure the day would come when ours would stand higher than theirs, and it was not long before such was the case.

‘It is a marvellous record that the exports of Canadian cheese for 1905-6 have reached the enormous value of over twenty-four million and a quarter of dollars, and the trade still growing.

‘Yours respectfully,

‘ADAM BROWN.’

THE OUTLOOK FOR CHEESE.

The Canadian cheese trade, being a practical monopoly, does not present as many sides or phases for discussion as the butter trade does. The present high prices for cheese, both actual and relative, naturally tend to encourage the making of cheese at the expense of butter, and many of the combined factories are preparing to make cheese for the season of 1907. It is not likely, however, that even should the market continue to favour the production of cheese, there will be much permanent increase in the amount of cheese available for export, because of the constantly increasing home demand.

Advices from New Zealand show that a considerable quantity of milk is being diverted from butter to cheese in that country. The probable increase from that quarter will not be large enough, however, to materially affect the situation, especially as the consumption of cheese at present seems to be closer to production than it has been for some years. On the whole, the outlook for the cheese trade seems bright and full of promise. It must not be forgotten, however, that with higher prices the question of quality becomes more important than ever, and a high standard must be obtained in order to keep up the consumption.

THE HOME TRADE IN CHEESE.

Although the annual consumption of cheese in Canada is increasing and the quantity consumed is now considerable, it is small compared with what it would be if there was any real attempt made to cater to the tastes of the people and to supply them with the kind of cheese which they like. The grocers who handle cheese, as a

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rule, do not pay very much attention to quality and are guided in their purchases almost entirely by the matter of price. Generally speaking, they will buy cheese at a quarter of a cent below the market price which the regular cheese buyer will not touch except at a big reduction. As a result, they are offered all the 'culls,' and they usually get them.

Another mistake grocers make is to wait until fall to lay in their stock, buying then the green, uncured cheese, which should not be eaten in less than five or six months.

The proper time to secure cheese for winter consumption is during the month of June, taking the cheese from the factory when they are 10 days or two weeks old and keeping them afterwards in a cool temperature to develop proper flavour. If the cheese are sound in flavour and are purchased at a factory where there is a cool curing room (not over 60 degrees) they will turn out best after 4 or 5 months if held at 55 or 60 degrees. If the cheese have been exposed to a temperature of over 60 in the curing room, it will be safer to hold them at a lower temperature. The cool cured cheese develop a mild but distinctly 'cheesy' flavour which is universally liked. The home or local trade is encouraged also by making small sizes and shapes. The small cheese weighing 10 to 15 pounds are very popular. Such cheese reach the consumer without cutting and thus a saving of considerable waste is effected. It costs more to make such cheese, but an extra price is readily paid.

These small cheese should be made with plenty of moisture, as the small shape permits of more rapid drying out.

If June cheese are selected for winter use, it is advisable to have them dipped in melted paraffin wax when they are about 10 days old, to prevent them from losing in weight and to retain the meatiness of texture which is so desirable. The small 10-pound cheese may be waxed at a week old, as they dry out more quickly than the large ones. For information on the waxing of cheese see Report for 1906.

There is an opportunity for factories with cool curing rooms to do a splendid business in catering to this local trade. Here and there one finds a grocer who has studied this part of his business with the result that his trade has grown enormously in this particular line. These men go direct to a reliable factory and contract for their best cheese, even if they pay a slight premium.

I would say to grocers, buy your cheese, if you can, from a factory with a cool curing room, and take the June cheese for winter use and September made for the following summer.

TABLE IV.—QUANTITIES OF CHEESE IMPORTED INTO THE UNITED KINGDOM IN THE YEARS 1900 TO 1906 INCLUSIVE.

(Years ending Dec. 31.)

From	1900	1901	1902	1903	1904	1905	1906
	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.
Holland	327,782	315,925	284,020	332,503	233,601	214,033	229,341
Belgium.....	62,059	74,071	70,372	87,998	63,694	64,389	76,021
France	35,110	26,833	33,801	36,004	41,268	48,884	43,241
Italy	0,417	714	732	726	642	727	544
United States.....	680,583	540,102	390,479	360,916	224,830	176,236	233,445
Other foreign countries.....	1,225	2,144	2,323	1,720	1,014	2,000	4,146
Australia	*3,386	149					
New Zealand.....	*77,617	79,094	51,875	56,339	84,947	78,626	126,216
Canada.....	*1,511,872	1,547,739	1,709,565	1,848,142	1,900,576	1,858,767	1,925,835
Other British possessions....	167	68	45	10	745		2
Total.....	2,705,878	2,586,837	2,546,212	2,694,358	2,554,297	2,442,682	2,638,794

* Cheddar variety.

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IMPORTS OF CHEESE INTO THE UNITED KINGDOM.

Table IV gives the total importation of cheese into the United Kingdom for the years 1900 to 1906, inclusive. During that period there has not been any very great change in the total annual importation. As a matter of fact, the figures show the largest importation for the period under review in the year 1900. The most notable changes in the imports during this period are the decrease in shipments from the United States and the increase in the quantity shipped from Canada, 1906 showing the largest quantity from Canada during the seven years mentioned. The next year or two will probably see some increase in the quantity of cheese from New Zealand, but the amount in any case will not be large enough to seriously affect the market, and will probably be offset fully by further decrease in the shipments from the United States.

SHIPPING GREEN CHEESE.

During the past two or three years the practice of shipping cheese from the factories in green condition, say two or three days old, has become far too common.

The practice probably owes its origin, in some measure, to the movement by which it was proposed to take the cheese from the factories as soon as they were made, and store them at a suitable temperature, with a view of having them cool cured. This is a very different matter from shipping the cheese to consumers in a green condition, and as compared with leaving cheese for ten days or two weeks in an ordinary curing-room during hot weather, is probably the lesser of two evils, and permissible only as a temporary arrangement or makeshift.

When green cheese are put into boxes and then held in cool storage, the actual process of curing or ripening is not interfered with, but there is danger of the rinds becoming soft and other 'skin troubles' arising. Moreover, the practice would have a demoralizing effect on the makers, who would lose the advantage of studying the results of their work by examination of the cheese after it is, at least partially, ripened.

The same objections can be urged against the shipping of green cheese for immediate export, with this further and more serious objection that it is sure to have a prejudicial effect on the market for Canadian cheese in Great Britain. The British consumer does not want green cheese, and considers it a serious defect in quality when such cheese is offered to him. In proof of this statement the following extracts from letters received by the writer from leading importers of cheese are submitted:

(From Eben Thomas & Co., Liverpool, dated December 19, 1906.)

'If this practice is continued, buyers on this side must take this loss into account in the price, but the more important feature of the matter is the deterioration in the quality brought about by putting the cheese on the market too green. It will have a detrimental effect upon the reputation of Canadian cheese, and prejudice the quality in the mind of the consumers.'

(From W. A. McKnight, Liverpool, dated December 19, 1906.)

'It seems to me that the factorymen are most to blame for marketing their cheese too soon, and as it is upon them that the loss must ultimately fall, I hope you will urge the importance of the matter upon them when you meet them.'

(From the Colonial Produce Co., Bristol, dated December 14, 1906.)

'You are, of course, aware that British cheese of the best qualities are this year fetching much higher relative prices than Canadian. This may be partly explained by other causes, such as the greater spending power of the purchaser, but may not some of it also be accounted for by the inferior quality of the Canadian cheese received in this country this year?'



FIG I. — An Ontario Cheese Factory.



FIG II.— An up-to-date Combined Cheese Factory and Creamery in Quebec.



Two Ontario Creameries.



A Maritime Province Creamery.



A British Columbia Creamery.

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(From Rowson, Hodgson & Co., Ltd., London, dated December 14th, 1906.)

‘When you were over in England you asked us to give you any details in connection with the business of the cheese trade which might be of interest to those immediately connected with the industry.

‘We have noticed very particularly that cheese have been drawn from the factories very young, and this has produced an insipid flavour. We cannot say that it is what is understood as strong flavour, in fact, it is difficult to define, but it is certainly not conducive to consumption. Of course, we have not the actual experience of putting them on the counter, but it is sufficient for us to know that buyers are dissatisfied, and consequently take a great amount of trouble in selecting something which will have a “cheesy” flavour.’

(From Pullin, Thomas & Slade, Bristol, dated December 13, 1906.)

‘We have serious complaint to make this season on account of the excessive short weight on cheese, brought about, we believe, entirely through same being shipped in far too green a state. It has meant a considerable loss to us financially and otherwise, as a large quantity of the goods have developed a bad flavour, undoubtedly on account of the heat having a much worse effect on immature cheese than it would have if they were properly cured.’

(From George Wall & Co., Liverpool, dated December 12, 1906.)

‘We have for some time intended writing you on the quality of this season’s make of Canadian cheese. Of course we know that your chief interest and ambition are centered in the progress and good name of Canadian dairy produce, and we consequently feel sure that you will receive any remarks we may make in the right light. We simply make them in the best interests of the trade, and not from any personal motives or from any wish to complain.

‘As a matter of fact, we think there are few who have so admired and complimented in past years the progress of Canadian dairy produce, and we have often held up the uniformity of the good quality of Canadian cheese as an example of perfect system and organization. Unfortunately, we have this season had many more complaints than usual, and we think you will consider it in the true interests of the Canadian cheese trade that we draw your attention to this. In our opinion the cause of all the trouble this season is the fact that many of the dairymen have allowed their cheese to leave the factory too green. They may of course think that it is policy to avail themselves of excited markets and good offers, but in our opinion, by doing so they are killing the goose which lays the golden egg.

‘If all the factories were to make an agreement that no cheese should be sent out before they were a certain age, this would be greatly to the benefit of the interests of the future reputation of Canadian cheese, and it certainly would not prevent buyers when they got excited from making high offers, nor would it prevent the factorymen from accepting such. In delivering cheese too green, the factorymen simply do it to oblige the dealers, and get no thanks for it. They would receive the same price if they simply stated that the cheese could not be shipped according to the rules of the trade until they were so many days older, but instead of doing this we feel confident that this year they must have allowed the cheese to leave the factory in many cases almost as soon as they were made, and as stated above, this has simply obliged the dealer, and done harm in reputation of Canadian cheese generally on this side.’

(From George Little, Limited, Manchester, dated December 12, 1906.)

‘The condition of the cheese when reaching this market is almost a scandal and points to the fact that cheese are not allowed to mature in the factory, but must be sent forward immediately, on the off-chance of the cheese ripening and maturing in

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transit. We have during the last few days landed some 1,000 to 1,500 boxes of cheese and there is hardly one that we can send out for immediate consumption. Buyers turn up their noses at such stuff and tell us that they will look at them again in a couple of months' time. The system of buying c.i.f. places an importer at a serious discount, as he literally buys a pig in a poke, and has to trust to the exporter to give him decent value. We have made up our minds to do less importing solely on these grounds, and we should be glad if you would place the saddle on the right horse and the blame on the right shoulders, and if at any conference of factorymen or officials in cheese centres, please urge the importance of amending this matter at once, otherwise the quality of Canadian cheese will decline more and more (as it has already done) in the estimation of the British public. Several years of prosperity and increased production may have made the dairy element indolent and indifferent about how their products turn out in this country, but it is a wrong policy to adopt and is inimical to the prosperity of your great country.'

(From Pearson & Rutter, Ltd., Manchester, dated December 12, 1906.)

'We have seen a good deal of correspondence recently in reference to Canadian cheese being shipped in too green a state.

'We are sure that this matter has only to be properly understood by the exporters and factorymen of Canada to receive their attention, as if this state of things continue the produce of Canada will suffer in reputation.

'No temporary and trifling gain of this sort will compensate for the loss of reputation, and it must be borne in mind that in the matter of cheese as well as butter, Canada will have to face a more severe competition than she has hitherto experienced.

'We shall be obliged if you will bring this matter forward whenever you have the opportunity to do so, and you are quite at liberty to use our name in connection with this matter.'

(From Wall & Co., Manchester, Ltd., dated December 10, 1906.)

'We would like to draw your attention to a very serious matter in connection with the shipping of Canadian cheese. We don't know whether it will interest you so much, but it certainly does interest us on this side, and it will also come to interest the factorymen as well. We refer to the practice which has been so prevalent this year of shipping green cheese. We have had cheese sent here which should have been on the factory shelves, and the result is, the article is not fit to show to customers, and if we do show it they condemn it.

'We had a parcel refused the other day for no other reason than this, and we had to find earlier made goods for our customer. This was not a small parcel either, and the buyer did not hesitate to tell us that it was the worst Canadian cheese we had ever tendered them. The fault was they were too green.'

The foregoing complaints from the largest handlers of Canadian cheese in Great Britain are surely serious enough to make every interested dairyman consider the question very carefully.

No opportunity has been missed to impress upon all dairymen the importance of this question and the desirability of taking steps to put a stop to a practice fraught with so much danger to the cheese industry. Unfortunately, the attitude of many people seems to be solely that of trying to put the blame on some one else. The Montreal Produce Merchants' Association (the exporters' association), in a circular dated February 23, 1907, addressed 'The Factorymen and the Creamerymen,' refer to the question in terms that would seem to imply that the factory owners are to blame. On the other hand, when the question is raised at a dairy meeting, many of the factory managers or salesmen are inclined to resent having any blame attached to them, and want to put the whole responsibility on the buyer. No doubt both are to blame, but

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it is of much more importance to devise or suggest a remedy than it is to discuss the somewhat abstract question of who is most to blame, because if we should succeed in settling that point, we would be exactly where we are now in regard to the main issue.

The writer has endeavoured to interest the real owners of the cheese—the men who provide the milk—because this question, as well as many others, will never be definitely settled until they become fully impressed with the real interest which they have in it.

The following letter was sent to all cheese boards, and to the press generally, and received wide publication:—

DEAR SIR,—I am informed by some of the dairy instructors in Ontario, that many of the cheese factories are shipping their cheese in a very green condition. In fact, one instructor writes that he has seen Monday's cheese boxed and shipped on Tuesday. It is difficult to understand how intelligent men can be induced to act so foolishly in the face of the positive warnings which they have received from time to time during the past year, as to the injurious effect of such a practice on the cheese trade of Canada. If we continue to ship green cheese to Great Britain at a time of the year when they are most likely to go into direct consumption, there can only be one result, and that will be to check the consumption of cheese enormously, with a consequent decrease in the demand, which is bound to have the effect of reducing the price before the season is over. It would seem to require scarcely a second thought to convince any person that it is a most suicidal policy to allow the cheese to be shipped when they are not in a condition fit for food and when their presence on the market will have the effect of stopping the consumption of cheese and encouraging the consumers to look for some other article of food.

It is useless to throw all the blame on the buyers, and to let it go at that. The buyers know the danger of this sort of thing well enough, and the fact that they are offering to buy the cheese is proof that they will not act in the interest of the producer when it serves their purpose to do differently. The factory manager or salesman cannot escape his responsibility for the protection of his own business, or the business of his patrons. It is quite evident that the only way to deal with this question is for the salesman to refuse to sell the cheese until they are fit for market. I appreciate the difficulty of individual action in a matter of this kind, owing to the strenuous competition among factories, but there is nothing to prevent the salesmen on the different cheese boards from agreeing as a body not to allow cheese to leave their factories until they have attained a reasonable age, say at least ten days or two weeks. Some of the cheese boards have already done so, and I venture to say that the factories represented will reap a handsome reward before the season is over, because the district which resolutely refuses to allow the cheese to go forward until they are in a proper condition, will add very materially to its reputation on that account. I know of no surer way of forcing the market down than by selling green cheese. Those who are following the sales on the cheese boards closely, will have noticed that certain districts are receiving a handsome premium over others, simply because they have sufficient foresight and good business judgment to recognize that it pays them to protect the reputation of their cheese in every possible way. When the patrons of cheese factories come to fully realize how vitally they are interested in the actual condition of the cheese, and to realize the enormous loss to Great Britain, they will make it a point for any factory manager or salesman who allows absolutely green cheese to be shipped from the factory.

What is the use of the government's spending money for the purpose of instruction if cheese are to be shipped before any one can determine anything about their quality? The instructors might just as well remain at home, under such circumstances. Any of the improvements which have been made in recent years, and which have done so much to help the cheese industry, will be almost wholly nullified if this sort of thing goes on.

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‘With the knowledge that I have as to the effect of this practice on the British market, I conceive it to be my duty to protest as vigorously as possible against a continuance of this practice and point out the inevitable results if it is continued.

‘J. A. RUDDICK,
‘*Dairy and Cold Storage Commissioner.*

‘OTTAWA, May 7, 1907.’

This appeal was made with a view of interesting the patrons of factories as well as the salesmen and factory managers. To the average cheese factory patron what looks like a temporary gain is apt to prevent him from seeing the ultimate results of any particular course of action. He is apt to insist that the salesman shall adopt the policy which will bring the highest immediate return, regardless of consequences in the future, and this is one of the difficulties which must be taken into account in dealing with this question.

The buyers could very easily put a stop to the shipping of green cheese by refusing to accept it, and being relatively few in number, as compared with the army of salesmen, it would be much easier for them to agree on concerted action. They know very well the danger of the practice, and yet they continue to encourage it. But if the buyers will not protect this important industry, surely it devolves upon those to whom it belongs, and who will suffer if it is injured, to make some effort to have the abuse corrected.

The following letter appeared in the *Farmer's Advocate*, over the writer's name, in reply to some comment by the editor on the letter already quoted:—

‘Referring again to the question of shipping green cheese, and to your editorial thereon in the issue of May 9, permit me to add one more word on the subject.

‘I fully agree with what you say about the blame which rests on the buyer, and the temptation which the salesman has to face when he is urged to let the cheese go as soon as they are out of the press. I have no excuses to offer for the buyer, but I have been more desirous of suggesting a remedy for the evil than to discuss the somewhat abstract question of who is most to blame, because if we do succeed in reaching a decision on that point we shall still be where we are now in regard to the main issue.

‘I notice that it is very generally assumed that there is a temporary gain to the factory which sells “green” cheese, and in your editorial you state that the buyer takes them because he is afraid of the price going down. Now, I take quite the opposite view of the case. I believe the buyer takes green cheese because he believes the market has an upward tendency, so that he will stand to profit by the increase. It does not follow that his judgment is always correct, but during the past year it more often turned out that way than otherwise.

‘No doubt a period of depression, with a falling off in the demand for cheese, would tend to cure the evil, as has been suggested. I am bound to say, also, that to continue the practice of shipping green cheese is one of the surest ways of bringing on such a depression, by lessening the consumption and causing stocks to accumulate. That will be a very expensive cure, however, and will cost the patrons of cheese factories many millions of dollars through lower prices. By holding back the cheese we increase the scarcity, stiffen the prices, and at the same time encourage the consumption of cheese by giving it time to reach a better condition, and thus help to continue the active demand.

‘Canadian dairymen have been very fond of congratulating themselves on their wisdom in refusing to make skim-milk cheese, or filled cheese, even at a temporary gain, and have professed to have been content to lose that gain for the sake of a good reputation and the future welfare of the trade. They now have another opportunity for a display of foresight and sound business judgment.

‘I am not thinking of the fodder cheese, which has always been moved out early, for the question is much wider than that. Nor do I fail to take into account the injury which results when cheese are held for a lengthy period in a hot curing-room.

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Shipping the cheese green, however, is only getting “out of the frying pan into the fire,” and is a mighty poor way out of the difficulty, considering how easy it is to provide a cool curing room.

‘Thanking you for your kind words of introduction to my letter on this subject, which appeared in the issue of May 16, I am,

‘J. A. RUDDICK,
‘Dairy and Cold Storage Commissioner.’

COOL-CURED CHEESE.

There will be a big increase in the number of cheese factories fitted with cool curing rooms in 1907. In Ontario the districts around Peterboro, Belleville and Picton are making the most progress in this matter. The reputation and character of the cheese from these sections are already showing the beneficial results which have followed the improvements. A number of curing rooms have also been improved and provided with ice chambers in Western Ontario. In Quebec the Lake St. John section is leading other parts of the province, with 22 factories properly equipped for cool curing. A curing room without an ice chamber and a circulation of air through the curing room is not considered a cool curing room.

THE GOVERNMENT COOL CHEESE CURING ROOMS.

The movement for the improvement of cheese curing is now so well under way that it is not considered necessary to operate the government illustration curing-rooms any longer, and the four establishments which have been conducted by this Branch will be disposed of. During the 5 years of operation 104 different cheese factories have sent cheese to these four curing rooms, and the total number of cheese supplied to each curing room is shown in the following table:—

	1902.	1903.	1904.	1905.	1906.	Totals.
Brockville.. .. .	6,644	9,856	9,740	5,999	12,430	41,669
Woodstock.. .. .	11,657	14,614	12,526	11,483	8,923	59,203
Cambridgeville.. .. .	6,266	14,672	12,014	8,650	4,325	45,927
St. Hyacinthe.. .. .	1,964	9,695	11,816	5,867	10,946	40,288
	26,531	48,837	46,096	31,999	36,624	190,087

COOL-CURED CHEESE APPRECIATED.

Many expressions of appreciation of the superior quality of cool-cured cheese are received at this office, of which the following are examples:—

‘13 GREENWOOD ST.,
‘Mr. J. A. RUDDICK, ‘MANCHESTER, December 18, 1906.
‘Department of Agriculture.

‘DEAR SIR,—We went through a line of white and coloured cheese to-day; September made, all western goods, looking for a few hundred boxes for a very particular buyer. We got him fixed up for white, but he was not altogether satisfied with the quality, and kept repeating that they were not up to our usual standard. On going to the coloured lots we picked 400 or 500 boxes without turning down a factory, and our buyer expressed the pleasure that it was to have cheese of this kind offered; every lot was as near perfection as you can get cheese.

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'On going into the matter to try and find the difference we at once saw that the coloured had been cured in a Government cool curing room at Brockville, while the white had been cured in the ordinary way.

'If any of your farmers had been in our warehouse to-day they would have had an object lesson in the value and importance of having their cheese all cured in the same way. In our minds it makes a very much bigger difference than people imagine, and if this plan was adopted generally Canadian cheese would hold a very much higher place in the opinion of the trade than it does to-day.

'Yours faithfully,

'WALL & CO., (MANCHESTER)

'Limited.'

Extract from a letter of a leading provision house in Bristol, Eng., (name not given) to Messrs. Olive, Dorion & Stroud, Montreal, with reference to a shipment of cheese from the St. Hyacinthe cool curing room:—

'Re Invoice No. 22, C. Cheese marked B. 6/11.

'We must say that we are very pleased with the out-turn of these cheese. They have come to hand in much better condition than the other lots in this steamer, and these in the previous steamer.

'We think we would do with a good quantity of this character of cheese, so if we should use the word 'Hyacinthe' when cabling, you will understand that we should like you to give a preference to cheese such as these; and if you use this word in cabling us, we shall understand that you will be including some of them in whatever cheese you may be offering in the message.'

The erection, equipment and maintenance of these cool curing rooms have cost quite a large sum of money, but no money has ever been spent in the interest of dairying in this country which has shown more tangible results, or from which the industry will derive greater benefit in proportion to the amount spent.

Cool-cured cheese are now being recognized as a special class, and are thus sold on some of the cheese boards at a premium over the price of ordinary-cured cheese.

Not the least important among the advantages derived from the government cool-curing rooms, were the facilities which they afforded for studying the problems involved in the improvement and management of cheese factory curing-rooms, to meet the requirements of cool-curing generally. As a result, we have been able to present plans and specifications to the cheese factory owners with a degree of confidence in their suitability which could not have been acquired in years of ordinary factory experience, nor without costly mistakes which would have been a serious clog on the progress of the movement. As it is we have been enabled to make recommendations involving a minimum of expense with a high degree of efficiency, and the plans and specifications supplied by this branch are being generally adopted.

For plans and specifications for the improvement of curing rooms and the erection of ice chambers see report of the Dairy Commissioner for 1906. Blue print copies on a larger scale will be sent free to any person who wishes to erect a modern cheese factory.

THE BUTTER INDUSTRY.

With the price of butter and cheese on a fairly even basis, the patrons of factories in many districts show a decided preference for manufacturing butter instead of cheese. This is particularly true of the province of Quebec, where a large percentage of the factories are equipped for the manufacture of both butter and cheese. This attitude on the part of the farmers will make for a considerable increase in the output of creamery butter when conditions are more favourable than they are at present.

There is a revival of dairying in some parts of western Ontario along the line of buttermaking. Cheese factories were first started in these districts, but by degrees

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the patronage fell off to such an extent that many of them were closed, and the farmers turned their attention more to the raising of beef. With the advent of the cream gathering creamery, by means of which a central establishment can be extended over a large area, and thus make co-operative or factory dairying possible in districts where the production of milk is not large enough to support a cheese factory, these same districts have taken up buttermaking as a sort of side line. The quantity of butter made in this way is considerable and is increasing yearly. With the introduction of better methods in the handling and delivery of the cream, there will not be as much criticism as there has been concerning the quality of the butter made at these creameries.

The creamery industry in the western provinces, particularly in Alberta, is making very satisfactory progress, and, being the main dependence of the farmers in Northern Alberta, is likely to be developed extensively and along good lines. Northern Alberta promises to become one of the most important creamery districts in Canada.

With the tremendous increase in the importation of butter into Great Britain from various countries supplying that market, the only hope for our export butter trade is to supplant a portion of the butter coming from other countries. This can only be done by manufacturing a superior article and placing it on the market in the best possible condition. The competition for the butter trade with Great Britain is very much keener than it is or ever was for the cheese trade, so that in order to be successful, more progressive methods must be employed than those which were sufficient to secure the cheese trade for Canada. There is some disadvantage in the fact that the total quantity of Canadian butter sent to Great Britain makes a comparatively small percentage of the whole importation, but it does not follow that because the quantity is small it is impossible to obtain high prices. If Canadian butter is made of such superior quality as to stand in a class by itself and above all others, there will be no difficulty in securing the top price for it. As proof of this statement we have only to cite the case of Normandy butter, which is not received in very large quantities but yet commands the highest price of any butter imported into Great Britain. It cannot be too often asserted that the thing of supreme importance in advancing the interests of our cheese and butter trade is to produce an article of superior quality.

DAIRY BUTTER.

The advantages of the creamery system are so obvious that it seems hardly necessary to say that that plan of buttermaking should be adopted wherever it is possible. It is not always possible, however, and for that reason dairy butter making must not be neglected.

There is great room for improvement in much of the dairy butter manufactured in Canada. The total quantity of dairy butter is very much larger than is generally supposed and, unfortunately for the creamery industry, much of this butter eventually finds its way to market packed in boxes, similar in style, shape and size to the boxes used for creamery butter, although the law prevents the branding of 'dairy' butter as 'creamery.' One of the worst features of the dairy butter trade is the way in which it is handled. Large quantities of butter are collected by country merchants who keep it for a considerable time, exposed to high temperature and other injurious conditions, so that the butter becomes stale and off flavour, no matter how well it is made. If the measures of preservation, such as cold storage and other protection from injurious influences, which are employed in the handling of creamery butter were applied to the dairy butter, it would mean thousands in the pockets of those who produce the butter.

MOULD ON BUTTER.

Reports of mould on butter are not as numerous as they have been, but we still hear of too many cases. One particularly bad case was brought to the attention of

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this office a few months ago by a firm of importers in Glasgow, who returned a box of the butter in question. The mould had grown all through the butter, making it absolutely worthless. An inspection of the creamery where this butter was made, showed great lack of attention to sanitary details. The place was not kept clean, and there was every opportunity for infection with mould.

The origin of mould in butter has provided the theme for many discussions and theories. Mould does not grow spontaneously any more than the larger plants which cover the surface of the earth; the seeds must be sown in the first instance. The spores (seeds) of mould are very common in the air and are present almost everywhere, but they do not germinate or grow except under certain conditions. There are three essential conditions for the growth of mould: (1) a suitable medium which will provide food for the plant; (2) moisture to support the growth of mould; and (3) a suitable temperature. Green, unseasoned wood contains both moisture and food for the growth of mould; many cases of the growth of mould on butter can be traced to this source; therefore it is important that butter packages should be made of thoroughly seasoned timber. There is always moisture in connection with a package of butter and sufficient nitrogenous matter in this moisture to furnish food for the growth of the mould. In the matter of temperature, the range through which mould will grow is a very wide one, and while it grows faster at high temperatures, the growth is not completely checked by temperature even below the freezing point of water.

In many cases the packages and the parchment paper used for lining the boxes are infected with the spores of mould while lying around the creamery. A creamery which is kept thoroughly clean, where the walls are disinfected regularly to prevent the growth of mould, and which is properly ventilated so as to be as dry as possible, is not likely to encourage the growth of mould, and very few cases are reported from creameries which are properly kept in this respect. A special place should be provided for keeping the parchment paper. A box or cupboard, which can be disinfected with the fumes of formalin or by other means, is desirable for the storage of parchment paper. The boxes and the paper should both be kept in the driest, cleanest place around the creamery, and the presence of dust should always be avoided. Buttermakers may take it for granted that they are largely responsible for all cases of mould reported on their butter. It is their business to see that these packages are made of proper material. It is their business to see that these packages and the parchment paper are properly handled and that the creamery is kept in a clean and sanitary condition.

Inferior parchment paper is often blamed for the presence of mould on butter, but poor paper can never be the primary cause. A poor quality of parchment paper, *i.e.*, one which has not been properly treated, simply provides food for the growth of mould, but the spores or seeds must be there in the first place, otherwise there would be no mould. It becomes important, therefore, that the paper should be a pure vegetable parchment which does not support the growth of mould.

The creamery cold storage should be thoroughly disinfected every few months by washing the whole interior with a solution of bi-chloride of mercury (corrosive sublimate) of a strength of 1 to 1,000. Any druggist will put up sufficient for the purpose. Being a very deadly poison, this substance must be carefully handled and cannot be used when the storage room contains butter. A treatment of this kind has the further advantage that it acts as a preservative of the wooden structure of the cold storage. The moulds which rot the wood are destroyed.

A simple coat of whitewash is effective in destroying mould.

IMPORTS OF BUTTER INTO THE UNITED KINGDOM.

Table V gives the total quantity of butter imported into the United Kingdom in the years 1900 to 1906, inclusive. The imports for 1906 were nearly one-third larger than in 1900, the actual increase being 958,472 cwts.

Denmark, the great source of supply, has not shown any increase since 1902. The

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imports into Great Britain from Denmark have been fairly steady for the last six years. The same may be said of Sweden and Norway. The greatest increase in the imports comes from Russia and Australia. Russia's increase for 1906 is 49 per cent over 1904 and 31 per cent over 1905. The Russian trade is reviving from the effects of the war. The enormous development of buttermaking in Australia since the great drought was broken is one of the notable features of the butter trade during recent years. The total quantity exported to the United Kingdom in 1902 was only 80,387 cwts., as against 561,114 cwts. in 1906, which is a record for that country. New Zealand also shows a steady increase. The figures of the shipments from the United States, showing an increase from 84,874 cwts. in 1905, to 157,312 cwts. in 1906, are rather a surprise to those who have expected the home consumption of butter in that country to leave less every year for export. This is the largest quantity of butter shipped from the United States for many years, being three times the amount shipped in 1900 and nearly double what was shipped in 1905. It is not likely, however, that the increase from the United States will continue. It is a regrettable fact from an export point of view, that Canada's share of the British butter trade in 1906 was 101,149 cwts. less than the previous year, and less than the quantity shipped in 1901 and 1902.

TABLE V.—QUANTITIES OF BUTTER IMPORTED INTO THE UNITED KINGDOM IN THE YEARS 1900 TO 1906 INCLUSIVE.

(Years ending December 31.)

From	1900.	1901.	1902.	1903.	1904.	1905.	1906.
	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.	Cwts.
Russia.....	209,738	378,452	490,091	484,328	404,717	461,140	606,549
Sweden.....	196,041	180,212	191,591	212,232	206,791	188,209	182,803
Norway.....	26,085	26,341	26,266	23,197	28,532	31,773	29,302
Denmark, Iceland and Greenland.....	1,486,342	1,597,186	1,703,032	1,771,654	1,708,619	1,630,363	1,675,761
Germany.....	36,042	26,983	26,375	12,507	4,080	5,372	10,701
Holland.....	282,805	298,912	393,261	343,761	252,262	209,897	195,366
Belgium.....	78,771	77,526	80,636	76,510	65,191	53,252	42,239
France.....	322,048	311,601	414,240	454,088	371,061	348,442	319,401
United States.....	56,046	150,126	54,458	42,405	68,754	84,874	157,312
Argentine Republic.....	27,098	22,787	69,336	80,491	82,568	77,013	48,737
Other Foreign Countries.....	920	515	23	586	.....	200	188
British East Indies.....	1,045	882	863	1,329	1,417	1,425	1,848
Australia.....	353,157	248,168	80,397	121,165	480,778	459,333	561,114
New Zealand.....	163,871	167,343	157,993	249,879	294,982	309,418	311,672
Canada.....	138,313	215,588	285,765	185,437	268,607	292,117	190,948
Other British Possessions.....	194	4	17	18	14	916	178
Total.....	3,378,516	3,702,890	3,974,933	4,060,694	4,241,005	4,147,896	4,337,253

Every once in a while some one comes forward with a glowing account of the possibilities and probabilities of the export of food products from the Argentine Republic. We have been told more than once that this country is to be one of the great butter producing countries of the world, and that we must prepare for severe competition from that quarter. We find, however, that the imports of butter from the Argentine into the United Kingdom reached the maximum in 1904, being 82,568 cwts. in that year, and that they have since declined, until in 1906 the amount imported was very little over half what it was in 1904.

The tremendous increase in the total importation no doubt accounts for the relatively low price of butter in Great Britain during the past few months. It is a point worth noting that there is very little probability of any large quantity of milk being diverted from butter to cheese, except in New Zealand and in Canada. Australia and Russia are not cheesemaking countries under any circumstances. The same

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applies to Denmark and other parts of Scandinavia. Holland, Belgium and France produce large quantities of cheese, but the varieties which they make do not fluctuate in price as Cheddar does, nor do they compete directly with that variety. It is quite probable that the comparatively low price of butter will have the effect of checking the production generally, and thus help to restore the equilibrium of values.

SANITATION AND DAIRYING.

There is abundant evidence of a world-wide awakening as to the importance of sanitation in connection with the production and handling of milk and the manufacture of butter and cheese. It is satisfactory to note that Canadian farmers and dairymen are considering these questions, but the fact that other countries are moving rapidly in this direction makes it all the more important that Canadians should be up and doing. The general public is taking a much deeper interest in the preparation of all food products than they have ever done before, and they are demanding stricter attention to hygienic principles and the adoption of sanitary methods in their preparation. The dairymen of Canada will be acting the part of wisdom to note carefully the growing necessity for giving all these matters careful attention, if they wish to encourage the consumption of dairy products. In the province of Ontario considerable progress has been made towards improving the conditions surrounding cheese factories and creameries, by the appointment of sanitary inspectors and the proposal to bring all factories under supervision in this respect. This movement on the part of the provincial authorities of Ontario fits in well with the efforts being made by this Branch to improve the character of the cheese factory and creamery buildings, because without improvement in the buildings and facilities for drainage, proper sanitation at many of the factories is quite impossible. The enforcement of sanitary precautions in connection with dairy work imposes no hardship on the owners of factories and those who supply the milk for the manufacture of butter and cheese, because proper precautions taken on these grounds will be reflected in the quality of the butter and cheese manufactured, and, speaking generally, any provision made to secure proper drainage and other sanitary conditions makes a permanent improvement in the building, which is much cheaper in the end than the old makeshift, slipshod construction which has prevailed too long in many instances.

For plans and specification for improved cheese factory and creamery buildings see Dairy Commissioner's Report for 1906.

THE IMPROVEMENT OF DAIRY HERDS.

The organization of cow testing associations, now being encouraged by this Branch, has for its object the improvement of the dairy herds of Canada. Reference was made to this work in our last report, and the plan on which the associations are organized is therein described. Bulletin No. 12 also deals with the subject in detail.

In view of the importance of this question, it has been considered advisable to publish a fairly complete statement of the performance of the individual cows under test during the year. Mr. C. F. Whitley, of the dairy staff, who has charge of the records, has compiled the figures and made the notes thereon which are found in the following pages. It may be as well to remind the reader who may examine these records, that, generally speaking, it was the best dairymen in the district who joined the associations, so that the records are in all probability higher, on the average, than they would be if the record of every cow in the locality was included.

Apart from the testing done as a result of the organization of these associations, a large number of individual dairymen have been induced to take up the work on their own behalf.

Some of the more progressive cheese factory and creamery managers are also

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taking an interest in the work, and have offered to do the testing for any of their patrons who desire to keep records of their herds. This is a legitimate work for any factory management to undertake, if satisfactory arrangements can be made to handle the extra work involved.

We regard this work so far as only preliminary to more thorough methods, which will include quantity and cost of feed, along with the value of the milk produced, in order to determine more accurately the net earning capacity of each cow.

The farmer who is not able to join a cow testing association, or to have samples of milk tested for percentage of fat, need not be deterred from keeping a record of weight of milk only, for the information such a record will give him will be found very useful in determining the relative value of his cows.

A careful study of Mr. Whitley's figures will reveal amazing contrasts in the production of cows of the same breed, receiving the same care and feed. One of the most important points brought out is that persistency in milk production is one of the main factors in building up a good year's record. Many cows start out well after calving, but show rapid shrinkage early in the season. It will be observed that a large number of the cows have been recorded only for five or six months and some even less, which represents in most cases the length of the milking period. A decided tendency to 'dry up' early seems to be the chief reason why a large proportion of the cows fail to make good records.

COW TESTING ASSOCIATIONS.

In 1906 sixteen cow testing associations were organized in Canada. Three were arranged in Ontario, at Brockville, Princeton and North Oxford, with a membership of 44 farmers entering 640 cows to be tested. In Quebec there were thirteen associations, at Cowansville, Mansonville, St. Armand, St. Edwidge, St. Camille, Lotbinière, Chicoutimi, Bagotville, Laterrière, St. Félicien, Normandin, Rivière à l'Ours and La Décharge, with a membership of 311 men and 3,882 cows.

The members agreed to weigh the milk from each individual cow in the herd, morning and evening, on three days during the month, at intervals of 10 days, right through the year. At each weighing a sample was taken, thus giving six samples from each cow every 30 days. The members provided themselves with spring scales, and one sample bottle for each cow. The Dairy Commissioner furnished blank forms, preservative, acid, &c., and an official to do the testing of the composite samples every month free of cost. Over 19,000 tests were made. Reports of each cow's yield were sent monthly to each farmer and a summary of each association's test was sent to all members, so that there was abundant opportunity of comparing the yields.

In many of the herds a decided increase in the flow of milk was noticeable in September. In some cases this was attributed by the members to cooler weather and better pasture. But where a little extra care and attention had been observed the results were marked: for instance, protection from flies, provision of green feed, and division of pasture into one or two small fields, allowing cows on the heaviest growth for two or three hours daily.

One of the best feeders and most successful dairymen amongst the members (see record of herd 27, Cowansville, Que.), writes that he feeds grain practically the year round, except for a short time when a cow is dry, in quantity according as her milk yield and her condition warrant. This indicates a careful study of the individual animal, which has evidently abundantly repaid him. In summer, he uses bran and cornmeal, and in winter gluten meal, linseed meal and ground barley. In winter, the roughage is ensilage, with early cut clover and mixed hay. The ordinary pasture on this particular farm is poor, so a liberal use is made of soiling crops: first clover; then peas, oats and vetches; then second crop clover; followed by green corn.

The prime object of the associations is to induce a study of each particular cow in the herd, with a view of keeping only such animals as will produce economically an abundant supply of milk containing a high percentage of fat.

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TABLE VI.—AVERAGE YIELDS, 16 COW TESTING ASSOCIATIONS, 1906.

Period.	QUEBEC.				ONTARIO.				GENERAL AVERAGE.			
	No. of Cows.	Milk.	Test.	Fat.	No. of Cows.	Milk.	Test.	Fat.	Total No. of Cows.	Milk.	Test.	Fat.
		lbs.		lbs.		lbs.		lbs.		lbs.		lbs.
4 Months	358	1,976	4.0	79.3	73	3,152	3.3	104.2	431	2,175	3.8	83.5
5 "	317	2,575	3.9	102.4	71	3,655	3.4	124.5	3.8	2,772	3.8	106.4
6 "	292	3,104	4.0	124.0	89	4,414	3.4	150.1	3.8	3,410	3.7	130.1
7 "	245	3,409	4.0	138.1	137	5,021	3.4	172.1	402	3,958	3.7	149.7
8 "	271	4,121	4.0	166.9	105	5,938	3.3	200.6	376	4,629	3.8	176.3
9 "	195	4,424	4.1	181.7	52	6,130	3.4	211.6	247	4,783	3.9	188.0
10 "	50	5,697	4.1	213.0	2	8,565	2.7	232.5	52	5,231	4.0	213.8
11 "	13	5,660	4.7	267.3	.....	.....	.....	.....	13	5,660	4.7	267.3

Table VI gives a summary of the tests made of such cows whose milk samples were sent in for four months or more. Unfortunately, many farmers only took weights and samples for one, two or three months ; then they discontinued despite several efforts made to persuade them to persevere.

Generally speaking, the prevalent idea that Quebec milk is richer than Ontario milk is borne out by these averages, for the average test runs higher in each period. As the details of the cows in each herd printed below indicate, the animals included are representative of several breeds and crosses. The Quebec averages, more especially those of eight months and over, are greatly helped by the particularly good records of the high grade Jersey herd No. 27, in the Cowansville association, combining a lengthy season of milk production and a high percentage of fat. Similarly, the Ontario results owe much to some pure-bred Holsteins at Brockville and North Oxford.

Taking these things into consideration, coupled with the fact that in most associations the membership is composed of farmers with the best herds in the district, there is strong probability that the averages here given are higher than the actual average production in these provinces. (See the following paragraph ‘Some Average Records.’) Further work of the same nature will in all likelihood throw more light on this point. However, no matter what the average may be now, it is confidently expected that the next few years will see a marked improvement. The careful observation of each individual cow in the herd by several hundred farmers cannot be without fruitful results.

After the eight months’ records, a rapid falling off in the number of cows tested is noticed. There may be some apathy in a continuance of the weighing month after month, which it is hoped to overcome as the benefits, indeed the necessity, of the work become more apparent; but the indications, from the weights sent in, are that the large majority of the cows were drying up quickly at the end of this period, which is all too short in this commercial age.

SOME AVERAGE RECORDS.

Ardock, Ont., cheese factory for the season of 1905, May 1 to October 31, had 315 cows giving an average of 2,596 pounds milk.

At North Star cheese factory, near Brockville, Ont., for the season of 1905, out of 22 herds whose total returns were carefully compiled, the highest average production of any one herd was 5,486 pounds of milk from 12 cows, costing \$38.50 to feed for the year, and yielding an average profit of \$7.89 per cow. At the same factory during the same time another herd of 15 cows had an average production of only 1,856 pounds of milk, indicating a serious loss when allowing fair prices for pasture, grain and hay.

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Three other herds at this factory had an average of only 2,241, 2,753 and 2,865 pounds of milk.

For the season of 1905, April 24 to November 4, at Scottsdale, Que., cheese factory, the average production of 284 cows was 2,024 pounds of milk. Giving full credit for the milk sent to the factory, allowing full value for the yield outside the factory season, as well as whey and skim milk, also valuing the milk and butter for domestic use, the average receipts per cow stood at \$28.61 for the full twelve months.

Not far from this is another cheese factory at Farnham Centre, Que., where the average yield of 472 cows was 3,040 pounds of milk, and the total receipts from all sources averaged \$36.07 per cow for twelve months.

SOME GOOD RECORDS.

In contrast to the foregoing these two herds are worth noting.

A good record at Huntingdon, Que., of 28 cows shows an average yield of 6,956 pounds of milk, testing 3.9, in 12 months.

A herd of 19 cows near Ingersoll, Ont., has an average yield of 7,231 pounds of milk in 9 months, value \$66.55 per cow. At the same factory the average of the 1,000 cows belonging to the patrons stands at 4,400 pounds of milk. It should not be difficult to increase the yield by 500 pounds of milk per cow; this would mean another \$4,500 coming to the patrons.

The records of each association may now be considered separately.

TABLE VII.—AVERAGE YIELDS OF 30 DAY PERIODS, BROCKVILLE, ONT., 1906.

30 Days ending.	Total No. of Cows.	AVERAGE.		
		Pounds of Milk.	Test.	Pounds of Fat.
Feb. 28	5	1,435	2.9	42.9
Mar. 30	14	1,032	3.2	33.3
April 30	50	828	3.1	25.9
May 30	146	891	3.3	30.2
June 30	162	934	3.2	30.1
July 30	131	823	3.1	26.0
Aug. 30	135	715	3.4	24.6
Sept. 29	97	763	3.4	24.3
Oct. 30	65	581	3.8	21.9
Nov. 30	82	356	3.7	13.3
Dec 30	28	442	3.5	15.7

Following this summary of each association will be found the details of each individual cow in every herd whose milk samples were sent in to be tested for four months or more during the year.

BROCKVILLE, ONT.

Taking the records of the Brockville association, in herd 9 it is found that 6 cows average 6,274 pounds of milk each in 9 months; a good showing. The best record for that period is 6,948 pounds from the 3-year-old cow No. 5.

In herd 2 is a strong contrast between the two 6-year-olds milking 10 months, a difference of 4,444 pounds of milk and 124 pounds of fat. Individuality is everything; it is not a matter of breed, age or pedigree only. In herd 2 the total fat production of cow No. 2 in 8 months is only 21 pounds lower than that of cow No. 1 in 10 months. The former indicates an average fat test of 3.4, the latter 2.8 per cent.

In herd 6, cow No. 16 is still working away at her life mission, milk production, at the age of 15. It is gratifying to note such commendable service. Are not some

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of our best cows, and best bulls, disposed of too early? Records of production will obviate sacrificing good stock prematurely.

Herd 12 contains 4 good cows with a good average fat production for 8 months, one of them almost touching the 10,000 pound mark in milk yield. Evidently it pays to grade up with a first-class sire.

In herd 14 the older animals milking 4 months show a far better average than those in herd 15, milking 6 months.

In herd 6 the 12 cows milking 6 months show a total production of 60,693 pounds of milk containing 2,075 pounds of fat; but in herd 15 the 12 cows milking 6 months show only a total of 35,359 pounds of milk and 1,123.8 pounds of fat.

Again, 6 cows in five months yield 30,984 pounds of milk, but in another herd 12 cows give only 32,749 pounds during the same period. It is evident that better cows mean not only much less work, but more profit and infinitely more satisfaction.

TABLE VIII—TOTAL PRODUCTION OF INDIVIDUAL COWS, BROCKVILLE, ONT.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
2	11	.....	2	August 10, 1906	5	3,290	90.9
	10	.....	3	" 7, 1906.....	5	4,185	115.1
	12	.....	4	" 10, 1906.....	5	5,940	158.5
	8	Holstein.....	10	May 14, 1906.....	7	4,921	144.7
	7	"	6	" 12, 1906.....	7	6,213	171.8
	9	"	2	" 20, 1906	8	4,364	130.5
	5	"	6	" 3, 1906.....	8	6,515	178.5
	6	"	11	April 26, 1906.....	8	6,830	185.7
	4	"	12	" 28, 1906.....	8	6,973	190.0
	2	Pure Holstein	3	February 26, 1906.....	8	8,081	273.3
	3	"	6	March 20, 1906.....	10	6,343	170.5
	1	"	6	February 18, 1906.....	10	10,787	294.5
3	6	Grade Ayrshire	5	March 11, 1906	4	2,560	78.3
	3	"	4	" 6, 1906.....	4	3,070	94.5
	4	"	5	" 9, 1906.....	4	2,870	98.1
	5	"	6	" 6, 1906.....	4	3,195	107.0
	1	"	5	February 25, 1906	4	3,710	128.8
	2	"	7	March 2, 1906.....	4	3,600	144.7
4	18	Grade Holstein.....	8	July 5, 1906.....	4	4,300	135.1
	17	.....	.....	June 7, 1906.....	5	3,518	108.4
	16	.....	.....	May 30, 1906.....	5	3,600	121.3
	14	Grade Holstein.....	2	" 6, 1906.....	6	3,490	105.6
	13	.....	.....	.....	6	4,470	138.3
	15	Grade Holstein	4	May 13, 1906.....	6	4,682	152.7
	12	.....	.....	.....	6	4,800	165.4
	1	Holstein	3	March 17, 1905.....	7	2,240	78.4
	10	Grade Holstein.....	7	" 31, 1906.....	7	4,710	151.0
	11	"	6	April 14, 1906	7	4,580	151.8
	9	"	4	March, 1906.....	7	5,900	191.5
	8	Holstein.....	7	" 28, 1906.....	7	7,050	209.6
	2	"	5	April 29, 1905.....	8	4,120	134.2
	3	"	7	February 20, 1905	8	5,020	163.5
	4	"	7	" 15, 1905	8	4,840	181.6
	7	"	9	March 22, 1906.....	8	6,140	185.9
	6	"	4	" 16, 1906.....	8	6,578	199.6
	5	"	5	" 7, 1906.....	8	6,289	238.2
6	9	Ayrshire	2	May 15, 1906.....	4	2,278	70.0
	12	.....	.....	.....	4	3,060	94.1
	13	Ayrshire .....	.....	.....	4	3,450	102.2
	10	Holstein.....	6	February 28, 1906	4	2,950	123.9
	17	Jersey.....	4	3,390	185.4
	1	Ayrshire.....	3	January 1, 1906.....	5	4,070	149.5
	18	"	5	4,640	178.6

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TABLE VIII.—TOTAL PRODUCTION OF INDIVIDUAL COWS, BROCKVILLE, ONT.
—Continued.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
6	20	.....	.....	April 20, 1906.....	6	3,710	147.5
	19	.....	.....	" 15, 1906.....	6	4,025	151.0
	15	Ayrshire.....	.....	.....	6	4,450	155.0
	4	Holstein.....	5	March 27, 1906.....	6	4,600	157.0
	3	Ayrshire.....	4	April 15, 1906.....	6	4,992	167.1
	7	Holstein.....	6	March 25, 1906.....	6	4,960	169.4
	16	.....	15	" 22, 1906.....	6	5,380	173.6
	5	Holstein.....	5	April 17, 1906.....	6	5,082	184.3
	8	.....	6	March, 1906.....	6	6,150	186.4
	11	Durham.....	8	April 16, 1906.....	6	5,354	186.8
7	2	Holstein.....	4	March 28, 1906.....	6	5,730	193.4
	6	".....	6	" 20, 1906.....	6	5,860	202.5
	15	Grade Ayrshire.....	3	May 15, 1906.....	5	2,485	88.0
	1	".....	5	" 27, 1906.....	5	3,335	108.7
	14	".....	5	" 18, 1906.....	5	3,275	127.7
	13	".....	5	" 17, 1906.....	5	3,775	145.9
	12	Grade.....	14	" 10, 1906.....	6	3,375	122.7
	4	Grade Ayrshire.....	8	March 27, 1906.....	7	4,050	140.8
	7	".....	11	April 7, 1906.....	7	4,198	154.6
	11	".....	13	" 14, 1906.....	7	4,193	155.0
8	3	Grade Holstein.....	5	March 27, 1906.....	7	4,305	156.2
	5	Grade Ayrshire.....	12	" 28, 1906.....	7	4,495	157.1
	6	Grade Holstein.....	3	April 6, 1906.....	7	4,394	160.0
	9	".....	5	" 8, 1906.....	7	5,130	178.5
	10	Grade Ayrshire.....	8	" 13, 1906.....	7	5,283	182.0
	8	".....	10	" 7, 1906.....	7	4,518	186.0
	2	".....	9	March 23, 1906.....	8	4,308	152.2
	12	Holstein.....	8	June 23, 1906.....	4	3,090	125.8
	11	".....	8	May 26, 1906.....	5	3,980	131.5
	10	".....	6	" 22, 1906.....	5	4,000	137.1
9	8	Grade Holstein.....	7	April 20, 1906.....	6	3,700	130.8
	9	".....	5	" 24, 1906.....	6	4,610	144.4
	3	".....	5	March 20, 1906.....	7	4,750	156.3
	7	".....	6	April 2, 1906.....	7	4,801	156.7
	1	Grade Durham.....	3	March 18, 1906.....	7	4,430	168.2
	5	Grade Holstein.....	8	" 26, 1906.....	7	5,030	170.7
	2	".....	4	" 20, 1906.....	7	5,200	190.0
	4	".....	6	" 21, 1906.....	7	5,700	190.5
	6	".....	7	" 30, 1906.....	7	5,920	194.7
	12	.....	3	June 5, 1906.....	7	4,790	169.3
10	11	Grade Jersey.....	10	May 20, 1906.....	8	4,830	160.8
	9	Grade.....	3	April 16, 1906.....	8	4,675	188.3
	10	Pure Ayrshire.....	6	May 3, 1906.....	8	6,466	219.3
	4	Grade Holstein.....	2	April 2, 1906.....	9	3,810	173.1
	8	" Jersey.....	2	" 14, 1906.....	9	4,172	166.1
	1	" Holstein.....	8	March 15, 1906.....	9	6,620	181.6
	3	" Ayrshire.....	9	" 24, 1906.....	9	5,280	212.1
	2	".....	7	" 16, 1906.....	9	5,630	235.2
	7	Pure Ayrshire.....	7	April 13, 1906.....	9	6,390	240.8
	6	Grade.....	6	" 14, 1906.....	9	6,776	248.3
12	5	Pure Ayrshire.....	3	" 12, 1906.....	9	6,948	258.7
	12	Grade Holstein.....	10	" 15, 1906.....	5	5,820	180.9
	9	".....	8	May 19, 1906.....	6	6,938	229.6
	11	".....	2	March 18, 1906.....	7	3,900	118.1
	10	".....	3	April 4, 1906.....	7	4,316	144.3
	2	".....	3	March 24, 1906.....	7	5,290	160.8
12	5	".....	7	April 25, 1906.....	7	5,630	214.6
	6	".....	7	May 11, 1906.....	7	7,310	224.2
	7	".....	8	" 15, 1906.....	7	6,740	231.4

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TABLE VIII.—TOTAL PRODUCTION OF INDIVIDUAL COWS, BROCKVILLE, ONT.
—Concluded.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
12	3	Grade Holstein.....	6	April 4, 1906.....	8	7,708	256.1
	4	".....	7	" 11, 1906.....	8	7,017	270.8
	1	".....	9	" 14, 1906.....	8	8,724	294.8
	8	".....	7	March 24, 1906.....	8	9,990	316.4
13	13	.....	6	May 24, 1906.....	4	2,795	85.0
	12	.....	12	" 6, 1906.....	4	3,264	122.2
	8	.....		April 16, 1906.....	5	2,728	92.1
	10	.....		" 19, 1906.....	5	3,324	100.8
	2	.....		" 2, 1906.....	5	2,868	118.5
	3	.....		" 4, 1906.....	5	3,407	118.8
	9	.....		" 18, 1906.....	5	3,664	123.1
	7	.....		" 15, 1906.....	5	3,512	125.3
	6	.....		" 8, 1906.....	5	3,520	120.0
	4	.....		" 3, 1906.....	5	3,609	130.4
	1	.....		March 15, 1906.....	5	3,880	137.4
	5	.....		April 9, 1906.....	5	3,562	140.0
14	14	Grade Holstein.....	3	March, 1906.....	4	2,880	80.8
	10	".....	3	April, 1906.....	4	3,090	84.3
	9	".....	4	" 1906.....	4	2,890	86.9
	1	".....	2	January 2, 1906.....	4	2,920	89.3
	13	".....	4	April, 1906.....	4	3,490	91.8
	3	".....	7	" 1906.....	4	3,530	96.8
	15	".....	4	" 1906.....	4	3,120	98.7
	8	".....	3	May, 1906.....	4	3,110	99.9
	6	".....	3	April, 1906.....	4	3,270	105.1
	2	".....	7	" 1906.....	4	3,300	107.1
	16	".....	6	" 1906.....	4	3,820	110.7
	12	".....	5	" 1906.....	4	3,430	112.1
	17	".....	8	March, 1906.....	4	3,600	117.2
	11	".....	8	April, 1906.....	4	3,950	118.3
	18	".....	4	March, 1906.....	4	3,320	118.6
	7	".....	4	April, 1906.....	4	4,120	137.6
	5	".....	10	" 1906.....	4	4,720	149.3
15	16	Grade.....	7	July 15, 1906.....	4	2,598	77.5
	14	".....	2	May 30, 1906.....	5	2,190	73.6
	15	".....	7	June 5, 1906.....	5	3,200	93.9
	13	Grade Holstein.....	2	May 14, 1906.....	6	2,309	68.7
	10	".....	3	October 15, 1905.....	6	2,210	70.4
	7	".....	3	December 1, 1905.....	6	2,490	77.3
	8	".....	4	March 15, 1906.....	6	2,520	85.2
	2	".....	3	April 20, 1906.....	6	3,050	86.2
	11	".....	3	" 20, 1906.....	6	3,000	91.8
	9	".....	6	March 20, 1906.....	6	3,010	97.5
	1	".....	4	April 1, 1906.....	6	3,240	99.5
	6	".....	6	" 2, 1906.....	6	3,380	99.8
	3	Common.....	8	March 25, 1906.....	6	3,170	104.0
	4	".....	9	April 20, 1906.....	6	3,390	121.5
	5	".....	8	" 23, 1906.....	6	3,590	121.9

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TABLE IX.—AVERAGE YIELDS OF 30 DAY PERIODS, PRINCETON, ONT., 1906.

30 Days ending	Total No. of Cows.	AVERAGE.		
		Pounds of Milk.	Test.	Pounds of Fat.
April 17.	31	540	3.3	18.1
May 14.	45	671	3.3	22.4
June 14.	85	816	3.4	28.5
July 14.	107	722	3.4	24.7
Aug. 14.	98	607	3.5	21.6
Sept. 14.	72	580	3.8	22.1
Oct. 14.	56	503	3.9	19.8
Nov. 14.	38	367	4.1	15.2
Dec. 14.	36	321	3.6	11.8

PRINCETON, ONT.

In herd 9 the 4 cows tested for 7 months have a total production of 14,850 pounds of milk, but in herd 16 the 4 cows in 7 months show 23,760 pounds, or 8,910 pounds of milk and 341.3 pounds of fat *more*.

There are great possibilities still to be achieved in building up a good herd.

TABLE X.—TOTAL PRODUCTION OF INDIVIDUAL COWS, PRINCETON, ONT.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
2	4	Grade Durham	5	April 15, 1906	6	4,475	174.6
	3	Grade Jersey	4	" 15, 1906	6	4,355	184.6
	5	" "	4	" 10, 1906	6	4,490	186.4
	1	Grade Durham	5	March 31, 1906	6	5,470	188.6
	2	Grade Ayrshire	7	April 14, 1906	6	5,670	201.3
3	2	"	4	May 13, 1906	4	2,700	100.1
	7	Ayrshire-Durham	5	April 19, 1906	5	2,924	92.5
	1	High Grade Durham	5	" 15, 1906	5	2,925	110.9
	4	Jersey-Durham	8	" 21, 1906	5	3,220	125.0
	5	High Grade Durham	7	" 20, 1906	5	3,711	130.8
4	1	Mixed, mostly Dur- ham Grades.		Calved between Feb. and June 1906.	4	2,055	78.8
	4				4	2,470	91.1
	7				4	2,640	96.3
	9				5	2,775	93.7
	5				5	2,815	104.5
	8				5	2,780	100.7
	3				5	3,100	114.2
	2				5	3,420	124.0
	10				5	3,140	128.3
	6				5	3,485	133.2
6	5	Jersey	8	February 21, 1906	5	2,100	87.4
	2	Common Grade	6	June, 1905, November, 1906	5	2,650	92.9
	1	Grade Durham	3	October, 1905	7	2,450	113.4
	4	Durham-Jersey	7	February, 1906	7	3,380	130.9
	3	Durham-Holstein	6	March, 1906	8	3,640	127.0
7	12	Grade Durham-Ayrshire	3	May 27, 1906	5	1,940	68.2
	13	" "	3	June 10, 1906	6	2,930	109.4
	4	Grade Durham	3	August, 1905, August, 1906	7	2,790	95.1

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TABLE X.—TOTAL PRODUCTION OF INDIVIDUAL COWS, PRINCETON, ONT.—*Concluded*

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
5	7	Grade.....	2	May 1, 1906.....	7	3,080	120·6
	8	High Grade Jersey.....	7	" 21, 1906.....	7	2,510	124·3
	11	Grade Ayrshire.....	7	" 26, 1906.....	7	3,400	126·3
	10	Ayrshire-Durham.....	5	" 28, 1906.....	7	3,520	142·2
	9	Grade.....	5	" 21, 1906.....	7	3,830	146·2
	1	Jersey.....	7	September, 1905	8	3,740	149·3
	3	Ayrshire-Durham.....	4	July, 1905.....	9	3,510	129·7
	6	Grade Durham.....	5	April 12, 1906.....	9	4,170	155·0
	5	Grade Ayrshire-Jersey.....	5	March 7, 1906.....	9	4,860	168·3
	2	Grade Durham.....	8	" 14, 1906.....	9	4,900	190·0
8	5	"	9	" 17, 1906.....	4	2,665	78·9
	6	Grade Jersey.....	6	May 23, 1906.....	6	3,303	125·5
	7	Grade Holstein.....	14	April 29, 1906.....	6	4,750	150·3
	4	Grade Durham.....	7	" 16, 1906.....	7	4,860	160·8
	3	Grade Jersey.....	5	March 28, 1906.....	8	5,140	179·7
	2	"	5	" 26, 1906	8	5,829	187·9
9	8	Grade.....	7	June 15, 1906.....	6	3,370	113·1
	7	"	5	April 20, 1906.....	7	3,700	115·9
	2	"	4	January 20, 1906.....	7	3,530	122·5
	5	Grade Durham	5	June 3, 1906.....	7	2,750	123·4
	1	Holstein.....	5	January 16, 1906	7	4,870	140·3
	6	Grade.....	5	April 25, 1906	8	4,310	161·5
	4	Grade Durham.....	3	January 8, 1906.....	9	3,910	131·6
	3	Grade Holstein.....	3	" 15, 1906.....	9	3,560	138·7
10	7	Grade Durham.....	3	October 20, 1905, October, 1906.	6	3,075	100·9
	8	Grade Holstein.....	3	September 1, 1905, August, 1906.	7	3,207	105·8
	1	"	2	April 16, 1906.....	7	3,900	123·1
	4	"	4	" 20, 1906.....	7	4,575	138·0
	3	"	4	March 14, 1906.....	7	4,902	147·3
	2	Common.....	5	September 20, 1905, August, 1906.	8	4,049	145·7
	6	"	5	March 30, 1906.....	8	5,308	171·9
13	7	Grade Jersey.. ..	2	April 15, 1906.....	4	2,160	68·9
	4	Grade Durham.....	8	March 21, 1906.....	4	2,615	83·7
	6	"	3	" 19, 1906.....	4	2,375	83·9
	5	"	8	April 4, 1906	4	2,810	93·3
	2	"	8	February 12, 1906.....	4	2,790	94·9
	1	Grade Jersey.....	8	" 8, 1906.....	4	3,035	99·2
	3	"	9	April 24, 1906.....	4	4,110	141·4
16	4	"	4	May 22, 1906.....	6	4,190	146·6
	6	"	5	" 25, 1906	6	5,270	190·6
	7	"	12	July 2, 1906.....	6	5,540	226·3
	2	Grade Durham.....	4	April 16, 1906.....	7	4,950	175·5
	3	"	11	" 20, 1906.....	7	5,380	194·6
	5	"	8	May 6, 1906.....	7	6,710	219·8
	1	"	8	April 8, 1906.....	7	6,680	253·5
17	2	"	5	December, 1905.....	4	1,715	65·0
	5	"	5	" 1905.....	4	1,940	72·6
	7	"	8	May, 1906	4	3,990	137·4
	6	Jersey-Durham.....	10	" 1906.....	4	3,525	138·4
	4	Grade Durham	3	December, 1905.....	5	2,130	84·5
	9	"	4	" 1905.....	5	2,175	85·4
	3	Holstein-Durham.....	6	February, 1906.....	5	4,295	147·0

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TABLE XI.—AVERAGE YIELDS OF 30 DAY PERIODS, NORTH OXFORD, ONT., 1906.

30 Days ending.	Total number of Cows.	AVERAGE.		
		Pounds of Milk.	Test.	Pounds of Fat.
April 21.....	80	833	3 2	27 2
May 21.....	209	873	3 2	27 9
June 21.....	288	1,004	3 2	32 9
July 21.....	304	867	3 2	28 0
Aug. 21.....	271	722	3 4	24 7
Sept. 21.....	278	728	3 3	24 5
Oct. 21.....	258	638	3 7	23 6
Nov. 21.....	183	521	3 8	19 8
Dec. 21.....	112	443	3 9	17 2

North Oxford, Ont.

In the weighing and sampling at North Oxford there was more persistent effort by the members than at the other two Ontario centres.

In herd 1 the 6-year-old cow No. 4 gives 182.7 pounds of fat, or 78 pounds less in 8 months than the 10-year-old cow No. 1. The variation in herd 9 for 7 months is from 148 to 122 pounds of fat, a difference of 74 pounds between the highest and lowest individual yields. It is similar in herd 10, the difference being 98 pounds of fat in 9 months between two 4-year-olds.

In herd 2 the 2 and 3-year-olds are making splendid promise.

Herd 7 has the gratifying average of over 260 pounds of fat from 9 cows milking 9 months. 7 of them are grades.

In herd 5 the 4 cows tested 7 months have a total yield of 15,190 pounds of milk, but in herd 4, 30,730 is the yield from the 5 cows tested 7 months; only one cow more, but more than double the quantity of milk. Again in herd 7 the 3 cows tested 7 months give 17,190 pounds, or 2,000 pounds more milk than the 4 cows in herd 5.

Attention is drawn to one important benefit of this association work. It not only saves farmers from wasting good feed on poor cows, but it also insures fairer treatment for good cows.

The owner of herd 2, who is a patron of the cheese factory and also ships milk to Toronto from Ingersoll, has very decided ideas as to what his cows should do for him if they expect him to provide them with board and lodging. One particular heifer did not come up to his demands and never gave more than 37 pounds of milk during any one day; accordingly he decided to sell her. However, on continuing the weighing, it was noticed that she did not fall off quickly or shrink very much in her yield. Hence the decision to retain her in the herd for a time. This was a most wise resolve, as she proved herself a good persistent milker and actually gave 11,155 pounds of milk, selling for \$115.54. The main point to notice is that this valuable animal, worth several hundreds of dollars, would have been needlessly sacrificed unless a definite system of weighing and recording the milk yield had been practiced.

Herd 14 has the excellent record of 9 cows tested 8 months yielding in that time a total of 69,702 pounds of milk.

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TABLE XII.—TOTAL PRODUCTION OF INDIVIDUAL COWS, NORTH OXFORD, ONT.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months tested.	Milk.	Fat.
						Lbs.	Lbs.
1	17	Durham.....	3	March, 1905.....	4	1,680	56.2
	16	".....	3	May, 1905.....	4	2,040	75.0
	21	".....	2	June 26, 1906.....	6	4,065	152.9
	20	".....	2	May 10, 1906.....	7	3,750	137.4
	19	".....	2	" 25, 1906.....	7	4,200	163.5
	18	".....	2	" 16, 1906.....	7	4,470	167.0
	8	Grade Durham.....	10	June 6, 1906.....	7	6,280	216.1
	4	Durham.....	6	April 24, 1906.....	8	5,449	182.7
	9	".....	8	May 4, 1906.....	8	5,231	185.5
	14	".....	3	" 10, 1906.....	8	5,396	188.7
	13	Grade Durham.....	4	April 13, 1906.....	8	5,610	204.0
	12	Durham....	6	" 5, 1906.....	8	6,100	211.7
	15	".....	3	May 4, 1906.....	8	6,095	215.4
	7	Grade Holstein-Durham....	9	April 21, 1906.....	8	6,920	216.1
	2	Grade Durham.....	9	" 15, 1906.....	8	6,240	222.3
	11	".....	10	" 13, 1906.....	8	6,480	223.5
	10	Grade Holstein-Durham....	7	" 13, 1906.....	8	7,205	232.8
	6	Grade Durham.....	12	" 18, 1906.....	8	6,285	245.5
	5	".....	11	" 11, 1906.....	8	6,585	250.8
	3	Grade Holstein-Durham....	7	" 18, 1906.....	8	7,375	256.1
	1	Grade Durham.....	10	May 10, 1906.....	8	7,200	261.1
2	30	Grade Holstein.....	6	April 6, 1905.....	5	3,010	111.5
	22	".....	4	October 5, 1905.....	6	4,025	142.0
	32	".....	4	" 1, 1905.....	6	4,060	154.4
	29	Holstein.....	4	August 9, 1905 ..	6	5,020	170.9
	23	Grade Holstein	12	Sept. 1, 1906.....	6	5,055	174.0
	11	Holstein	2	April 4, 1906.....	7	3,287	110.9
	21	".....	2	August 2, 1905.....	7	4,305	147.1
	31	Grade Holstein	5	September 3, 1905.....	7	4,355	158.6
	26	".....	5	" 20, 1905.....	7	4,885	159.2
	28	".....	4	October 1, 1906.....	7	6,145	205.6
	12	".....	3	April 19, 1906....	8	5,335	172.4
	4	".....	2	" 23, 1906.....	8	5,055	178.8
	20	Holstein.....	3	December, 1905	8	5,775	180.8
	24	Grade Holstein	13	November 20, 1905	8	5,470	186.8
	6	".....	4	May 6, 1906.....	8	5,848	193.2
	7	Holstein	3	April 23, 1906.....	8	6,620	208.8
	3	Grade Holstein	12	" 25, 1906.....	8	7,170	215.4
	2	".....	12	May 12, 1906.....	8	7,550	221.8
	15	".....	3	March 12, 1906.....	8	6,490	229.9
	1	".....	10	May 5, 1906.....	8	8,174	289.7
	13	".....	2	March 26, 1906.....	9	5,240	181.0
	10	Holstein	2	April 2, 1906.....	9	5,300	181.2
	9	".....	2	March 4, 1906.....	9	6,190	199.0
	16	Grade Holstein	3	April 4, 1906.....	9	6,160	202.0
	14	".....	3	March 12, 1906.....	9	6,545	205.7
	25	Holstein	2	November 5, 1905.....	9	6,600	214.7
	5	Grade Holstein	2	April 5, 1906.....	9	6,520	223.6
	27	".....	5	October 18, 1905.....	9	7,180	223.8
	17	".....	4	March 22, 1906.....	9	6,475	228.1
	18	".....	4	" 3, 1906.....	9	6,915	254.6
	8	".....	4	" 25, 1906.....	9	7,652	268.5
3	16	Grade	11	May 19, 1906.....	6	4,115	127.7
	15	".....	12	" 19, 1906.....	6	4,490	134.8
	11	".....	7	April 24, 1906.....	7	4,190	121.3
	13	".....	8	" 30, 1906.....	7	5,237	165.7
	14	".....	10	May 12, 1906.....	7	5,560	181.9
	9	".....	9	April 20, 1906.....	7	4,920	190.8
	10	".....	7	" 21, 1906.....	7	5,470	209.4
3	12	Grade	11	April 30, 1906.....	7	6,316	244.4
	8	".....	3	" 13, 1906.....	8	4,328	139.3
	7	".....	12	" 12, 1906.....	8	5,605	144.3

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TABLE XII.—TOTAL PRODUCTION OF INDIVIDUAL COWS, NORTH OXFORD, ONT.
—Continued.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
4	1	Grade ..	6	March 1, 1906..	8	5,470	152.1
	6	" ..	5	April 10, 1906..	8	5,329	179.5
	3	" ..	12	March 15, 1906..	8	4,940	194.0
	5	" ..	5	April 3, 1906...	8	5,840	202.1
	4	" ..	7	" 1, 1906.....	8	6,040	203.2
	2	" ..	7	March 20, 1906..	8	6,850	212.1
	9	Grade Holstein.	8	May 27, 1906 ..	5	4,900	141.9
	7	" ..	6	" 27, 1906 ..	6	5,980	180.3
	19	" ..	3	" 27, 1906 ..	7	5,230	153.9
	15	" ..	3	" 15, 1906 ..	7	5,500	170.1
	6	" ..	8	" 27, 1906 ..	7	6,490	197.7
	8	" ..	8	March 5, 1906..	7	6,740	199.5
	5	" ..	8	" 28, 1906.....	7	6,770	200.4
	17	" ..	3	April 20, 1906..	8	5,405	173.4
	13	" ..	3	May 1, 1906 ..	8	5,492	179.2
	3	" ..	10	April 22, 1906..	8	6,970	206.1
	11	" ..	6	" 27, 1906.....	8	6,783	226.7
	4	" ..	10	May 1, 1906 ..	8	6,893	236.5
	20	" ..	3	March 21, 1906..	9	5,390	171.1
	18	" ..	3	April 8, 1906...	9	6,535	198.2
	1	" ..	4	March 7, 1906.....	9	6,935	204.9
5	14	" ..	3	April 5, 1906.....	9	5,735	204.4
	2	" ..	5	March 4, 1906..	9	6,860	218.9
	16	" ..	3	April 1, 1906..	9	6,700	219.1
	10	" ..	4	March 27, 1906..	9	7,710	219.4
	12	" ..	7	April 2, 1906 ..	9	7,615	244.6
	15	Grade Holstein.	5	August 13, 1906..	4	2,270	81.4
	13	Grade.	6	" 18, 1906.....	4	2,760	97.1
	16	Grade Holstein	8	April 26, 1906..	6	4,050	113.7
	17	Grade Durham	8	" 10, 1906.....	6	4,330	130.2
	4	Grade Holstein.	6	June 20, 1906.....	6	4,450	138.9
	10	" ..	2	May 25, 1906 ..	7	3,210	108.0
	14	" ..	6	" 1906 ..	7	3,880	146.3
	8	Grade Jersey...	9	June 11, 1906.....	7	3,610	148.5
	2	Grade Holstein	4	April 25, 1906..	7	4,490	149.8
	11	" ..	2	" 13, 1906.....	8	2,660	109.5
	1	" ..	3	" 10, 1906.....	8	4,260	143.6
	12	" ..	4	" 26, 1906.....	8	4,880	159.1
	18	" ..	5	" 25, 1906.....	8	4,960	167.0
	5	" ..	8	" 22, 1906.....	8	5,500	168.3
	7	" ..	10	" 24, 1906.....	8	4,810	171.1
	9	" ..	8	May 17, 1906 ..	8	5,545	180.1
6	3	" ..	8	April 12, 1906..	8	4,970	180.4
	6	Grade Jersey.	9	May 1, 1906 ..	8	4,345	182.9
	1	Grade ..	3	" 22, 1906 ..	4	2,770	99.1
	4	" ..	3	" 24, 1906 ..	4	3,230	103.5
	11	" ..	10	" 24, 1906 ..	4	3,710	112.9
	13	" ..	3	" 11, 1906 ..	5	3,570	117.1
	14	" ..	3	April 24, 1906..	5	3,010	120.1
	5	" ..	7	May 5, 1906...	5	4,192	154.5
	8	" ..	5	" 5, 1906.....	5	5,505	180.2
	10	Grade ..	3	April 8, 1906...	6	5,335	150.3
	7	" ..	5	March 20, 1906..	6	5,070	164.0
	6	" ..	7	" 14, 1906.....	6	5,520	173.5
	12	" ..	5	April 5, 1906...	6	6,328	194.4
	2	" ..	8	March 17, 1906..	6	5,720	195.7
7	19	Pure.....	7	May 1, 1906 ..	7	5,400	188.9
	11	Grade Durham.	7	March 20, 1906 ..	7	6,350	205.7
	20	Pure.....	4	May 12, 1906 ..	7	5,440	209.7

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TABLE XII.—TOTAL PRODUCTION OF INDIVIDUAL COWS, NORTH OXFORD, ONT.
—Continued.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
7	8	Pure Durham	6	April 4, 1906.....	8	5,967	185·9
	13	Grade	3	" 6, 1906.....	8	5,040	201·5
	16	"	4	" 8, 1906.....	8	6,360	227·9
	18	Grade Durham.....	7	" 14, 1906.....	8	6,910	242·3
	14	Grade	6	" 15, 1906.....	8	6,540	252·3
	15	"	4	March 26, 1906.....	8	6,850	254·2
	12	Grade Durham.....	6	April 2, 1906.....	8	7,130	264·3
	17	Pure Ayrshire.....	5	" 4, 1906.....	8	7,670	265·7
	7	Pure Durham	8	" 6, 1906.....	9	6,945	225·9
	6	Grade	6	" 5, 1906.....	9	6,658	229·2
	4	"	7	March 15, 1906.....	9	7,780	249·3
	10	"	5	April 3, 1906.....	9	7,166	251·5
	1	Grade Durham.....	7	" 1, 1906	9	6,080	257·1
	3	Grade	7	March 12, 1906.....	9	8,420	275·4
	9	"	7	April 1, 1906.....	9	8,380	281·0
	2	"	6	" 3, 1906	9	7,554	282·2
	5	Pure Durham	8	" 4, 1906.....	9	8,102	296·7
8	5	Pure Holstein.....	5	May 2, 1906	4	4,080	108·2
	6	"	7	April 26, 1906.....	4	3,374	111·7
	17	"	3	March 31, 1906.....	5	3,135	99·9
	1	Grade Holstein	4	April 4, 1906.....	5	3,413	109·7
	8	"	8	" 3, 1906.....	5	3,684	115·3
	2	Grade Holstein.....	9	" 10, 1906.....	5	3,680	132·5
9	9	"	8	" 12, 1906.....	5	3,955	146·5
	6	Durham.....	3	" 1, 1906.....	7	4,130	148·0
	2	Holstein	4	" 13, 1906.....	7	4,799	158·7
	5	Durham.....	7	" 14, 1906.....	7	5,047	175·5
	10	Holstein	5	" 4, 1906.....	7	5,830	181·7
	3	Durham.....	7	" 10, 1906.....	7	5,415	184·7
	8	Holstein	8	April 4, 1906.....	7	5,905	195·0
	1	"	4	" 8, 1906.....	7	5,456	195·7
	4	Durham.....	9	" 8, 1906.....	7	5,733	199·3
	9	"	7	" 10, 1906.....	7	5,815	216·0
10	7	Jersey	8	" 3, 1906.....	7	5,805	222·2
	13	Pure Holstein.....	4	June 7, 1906	7	4,631	142·9
	3	Grade Jersey		March 8, 1906.....	7	5,080	184·2
	11	"	9	May 1, 1906.....	8	3,985	173·3
	1	"	7	December 10, 1905	8	4,930	185·4
	12	Jersey Holstein....	7	May 4, 1906	8	5,829	209·2
	2	Grade Jersey	7	December 3, 1905	8	5,185	211·0
	8	Grade Ayrshire.....	4	March 31, 1906.....	9	4,590	164·2
	5	Grade Holstein.....	9	" 13, 1906.....	9	4,655	167·9
	10	Ayrshire-Durham	11	April 12, 1906.....	9	5,817	173·2
	4	Grade Holstein.....	4	March 12, 1906.....	9	5,360	176·1
	7	"	4	" 20, 1906.....	9	6,050	225·4
	6	"	11	" 15, 1906	9	7,095	230·9
	9	Ayrshire-Jersey	4	" 25, 1906.....	9	6,570	262·2
11	30	Grade Holstein.....	10	June 25, 1906.....	4	3,710	120·3
	29	"	7	May 6, 1906.....	5	4,640	156·1
	25	Grade Ayrshire.....	2	April 26, 1906.....	6	4,066	131·7
	23	Grade Holstein....	10	" 17, 1906.....	6	4,310	146·1
	26	"	2	" 25, 1906.....	6	3,740	157·0
	20	Grade Ayrshire.....	5	April 15, 1906.....	6	4,843	158·6
	24	"	6	" 10, 1906.....	6	4,610	179·3
	21	Grade Holstein.....	6	" 11, 1906.....	6	5,920	181·2
	28	Grade Guernsey.....	7	May 1, 1906.....	6	5,070	181·9
	22	Grade Durham.....	7	April 12, 1906.....	6	6,080	182·6
	19	Grade Holstein.....	2	" 18, 1906.....	6	4,350	190·2
27		"	8	May 3, 1906.....	6	5,852	192·7

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TABLE XII. TOTAL PRODUCTION OF INDIVIDUAL COWS, NORTH OXFORD, ONT.
—Continued.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk. Lbs.	Fat. Lbs.
11	2	Grade Ayrshire.....	10	January 5, 1906.....	7	4,320	147.3
	10	Grade Holstein.....	3	February 2, 1906.....	7	4,200	147.8
	11	".....	3	March 25, 1906.....	7	4,850	166.8
	1	".....	5	January 9, 1906.....	7	5,330	179.7
	15	Grade Durham.....	10	March 21, 1906.....	7	5,110	179.8
	13	".....	8	" 11, 1906.....	7	5,470	187.2
	9	Grade Holstein.....	7	" 8, 1906.....	7	5,460	188.1
	5	Grade Jersey.....	5	" 11, 1906.....	7	5,100	190.9
	12	Grade Guernsey.....	7	" 13, 1906.....	7	5,660	195.0
	7	Grade Holstein.....	8	" 24, 1906.....	7	6,050	203.8
	4	Grade Ayrshire.....	7	February 16, 1906.....	7	6,360	209.8
	3	Grade Jersey.....	7	" 17, 1906.....	7	5,390	210.5
	17	Grade Ayrshire.....	6	March 25, 1906.....	7	5,750	212.8
	16	Grade Durham.....	5	" 27, 1906.....	7	6,420	215.6
	18	".....	5	" 3, 1906.....	7	5,790	218.6
	6	".....	7	" 24, 1906.....	7	6,470	225.3
	14	".....	9	" 20, 1906.....	7	6,010	228.3
	8	Grade Ayrshire.....	6	" 7, 1906.....	7	5,690	232.0
12	5	Grade.....	6	" 21, 1906.....	6	3,760	123.0
	13	".....	5	April 16, 1906.....	6	3,630	129.3
	15	".....	5	May 2, 1906.....	6	4,550	132.9
	14	".....	6	" 1, 1906.....	6	3,730	138.1
	12	".....	5	April 20, 1906.....	6	4,490	153.1
	11	".....	12	" 24, 1906.....	6	4,922	174.1
	10	".....	7	" 26, 1906.....	6	6,380	240.8
	6	".....	11	March 9, 1906.....	7	4,290	146.0
	8	".....	5	" 20, 1906.....	7	4,860	173.4
	9	".....	4	" 19, 1906.....	7	4,840	174.6
	7	".....	7	" 6, 1906.....	7	5,580	195.5
	1	".....	10	" 19, 1906.....	7	5,730	200.0
	4	".....	11	" 26, 1906.....	7	5,500	203.6
	2	".....	9	" 8, 1906.....	7	6,060	221.4
13	3	Grade Holstein.....	3	March, 1906.....	4	2,640	85.5
	9	".....	3	" 1906.....	4	2,725	95.9
	7	".....	7	" 1906.....	4	3,265	97.7
	2	".....	2	" 1906.....	4	3,260	100.0
	1	Grade Ayrshire.....	7	" 1906.....	4	3,590	103.5
	8	Grade Holstein.....	5	" 1906.....	4	3,270	107.4
	5	Grade Ayrshire.....	3	" 1906.....	4	3,280	109.2
	4	Grade.....	8	" 1906.....	4	3,760	120.3
	10	".....	7	" 1906.....	4	3,385	123.9
14	3	Durham.....	14	July 22, 1906.....	4	3,785	143.7
	5	".....	.....	.....	5	3,145	99.7
	10	Holstein.....	3	October, 1905.....	6	2,910	89.9
	17	".....	8	March, 1905.....	6	3,725	110.6
	13	".....	6	May 11, 1906.....	6	5,190	219.8
	18	Ayrshire.....	8	" 15, 1906.....	6	7,705	268.4
	4	Durham.....	4	April 21, 1906.....	7	5,555	188.8
	6	Holstein.....	6	" 18, 1906.....	7	6,440	188.9
	12	".....	6	" 25, 1906.....	7	7,387	263.0
	9	".....	3	" 13, 1906.....	8	5,459	182.2
	14	".....	8	" 13, 1906.....	8	7,273	211.8
	7	".....	6	March 30, 1906.....	8	7,365	220.8
	1	".....	3	" 12, 1906.....	8	6,735	228.9
	2	Ayrshire Holstein.....	9	February 26, 1906.....	8	8,000	267.3
	15	Holstein.....	9	March 26, 1906.....	8	10,070	273.5
	16	Durham.....	7	" 22, 1906.....	8	7,945	279.3
	11	Holstein.....	13	April 2, 1906.....	8	7,195	285.0
	8	".....	10	March 24, 1906.....	8	9,660	327.3

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TABLE XII.- TOTAL PRODUCTION OF INDIVIDUAL COWS, NORTH OXFORD, ONT.
—Concluded.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
15	2	"Scrub"	9	March 27, 1906.....	6	3,840	123.5
	3	Ayrshire.....	7	" 24, 1906.. . . .	6	4,380	152.6
	7	Grade, Jersey-Ayrshire.....	9	April, 1906.....	7	5,730	198.0
	4	Holstein-Jersey.....	4	" 6, 1906.....	8	4,835	159.5
	5	Holstein.	2	" 7, 1906.....	9	4,690	147.3
	1	Ayrshire.....	8	March 25, 1906.. . . .	9	5,595	188.9
	6	Guernsey.....	8	April 7, 1906.....	9	6,885	241.6
16	13	Gr. Durham.....		" 25, 1906.. . . .	5	4,340	162.2
	17	Gr. Holstein.. . . .		May 2, 1906.....	5	4,870	173.3
	19	Registered Holstein.....	5	March 27, 1906.....	5	6,750	224.2
	7	Gr. Durham.....	4	April 26, 1906.....	6	4,616	147.1
	8	"	4	" 23, 1906.....	6	5,390	199.1
	15	"	2	March 19, 1906.....	7	3,910	130.3
	18	Registered Holstein.....	5	April 2, 1906.....	7	5,710	153.3
	16	Gr. Holstein.....	2	March 26, 1906.....	7	4,340	158.7
	3	Gr. Durham.....	10	" 20, 1906.....	7	5,430	158.9
	12	"	7	" 24, 1906.....	7	5,620	164.3
	6	Gr. Holstein.	14	April 3, 1906.....	7	4,930	166.9
	14	"	4	March 21, 1906.....	7	5,050	167.2
	10	Gr. Durham.	5	April 17, 1906.....	7	5,250	167.3
	9	"	5	March 20, 1906.....	7	5,130	170.8
	1	Durham....	5	" 20, 1906.. . . .	7	6,020	192.8
	11	Gr. Durham.....	5	" 22, 1906.....	7	5,590	193.1
	5	"	15	" 26, 1906.....	7	6,240	194.6
	4	Gr. Holstein.....	11	" 21, 1906.. . . .	7	5,930	202.3
	2	Gr. Durham.....	10	" 21, 1906.....	7	5,580	209.1
17	9	Gr. Holstein.....	12	.....	4	3,385	102.1
	11	Gr. Jersey.....	6	.....	4	2,945	109.8
	8	Gr. Holstein.....	12	.....	4	3,600	113.8
	10	Gr. Durham.. . . .	3	.....	5	2,595	82.9
	3	"	2	.....	5	2,655	88.2
	4	"	2	.....	5	2,700	88.8
	17	Gr. Holstein.....	3	.....	5	2,730	94.9
	18	"	3	.....	5	2,980	98.0
	12	Gr. Jersey.	6	.....	5	3,585	120.4
	14	Gr. Holstein.	7	.....	5	3,860	121.2
	15	"	7	.....	5	4,310	123.7
	13	"	7	.....	5	3,735	130.8
	7	"	7	.....	5	4,780	134.5
	16	Gr. Durham.....	6	.....	5	3,980	136.5
	6	Gr. Ayshire.. . . .	13	.....	5	5,005	142.1
18	2	Gr. Holstein.....	13	July 18, 1906.....	4	4,279	129.8
	12	Gr. Durham.....	3	April 12, 1906.....	6	2,440	78.4
	8	"	15	June 5, 1906.....	6	2,744	89.9
	20	Gr. Jersey-Durham.....	2	" 12, 1906.....	6	2,780	102.9
	19	Gr. Durham-Holstein	2	April 19, 1906.....	7	2,285	70.6
	15	Gr. Holstein.....	3	May 4, 1906.....	7	3,600	119.5
	6	Gr. Durham.....	5	" 7, 1906.....	7	5,145	163.5
	18	Gr. Holstein.	2	April 19, 1906.....	8	4,135	128.2
	14	"	3	" 6, 1906.....	8	4,380	137.7
	13	"	3	" 12, 1906.....	8	4,625	149.3
	4	"	5	" 1, 1906.....	8	5,090	151.7
	7	Gr. Durham.....	6	" 15, 1906.....	8	4,305	159.7
	10	"	9	January 3, 1906.....	8	4,625	161.8
	17	Guernsey.....	7	March 27, 1906.....	8	4,565	170.2
	3	Gr. Holstein.	5	" 18, 1906.....	8	5,670	178.0
	9	Gr. Jersey.	7	" 28, 1906.....	8	5,305	188.3
	5	Gr. Holstein.....	6	" 31, 1906.....	8	6,710	202.9
	11	"	4	April 19, 1906.....	8	6,160	204.4

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TABLE XIII.—SHRINKAGE IN MILK; TWO HERDS: NORTH OXFORD, ONT.

Herd A, 16 cows, Average Yield of Milk. lb.		1906.	Herd B, 15 cows, Average Yield of Milk. lb.	
1,024	.....	June.....	831	
842	.....	July.....	865	
663	.....	August.....	666	
631	.....	September.....	703	
Total.....			Total.....	
3,160			3,005	
Shrinkage... 38 %		Four Months.....	Shrinkage.... 15 %	

Table XIII illustrates in a striking manner the difference in shrinkage of milk between two herds in the North Oxford association. In herd A the September average yield was 38 per cent less than the June yield of milk, but in herd B the shrinkage was only 15 per cent. If in herd A the shrinkage had been only 15 per cent the owner would have had 3,840 pounds of milk more from the same cows in *September alone*, or nearly \$38 more income. The owner of herd A admits that his cows did not receive as good attention or as much feed as usual. Neglect is costly. The owner of herd B states: ‘We are careful to milk regularly at the same times every day, letting nothing interfere with milking. We fed a little oat chop all through the season until the corn was ready. We are generally the first to stable the cows in the fall and the last to turn out in the spring.’ Such careful attention pays well.

TABLE XIV.—AVERAGE YIELDS OF 30 DAY PERIODS, COWANSVILLE, QUE., 1906.

30 Days ending.	Total number of Cows.	AVERAGE.		
		Pounds of Milk.	Test.	Pounds of Fat.
Jan.....	36	520	4.1	21.6
Feb.....	60	524	4.1	21.8
Mar.....	104	563	3.7	21.3
April 23.....	261	561	3.4	19.6
May 22.....	373	566	3.6	20.9
June 22.....	414	646	3.7	24.4
July 22.....	391	582	3.8	22.5
Aug. 23.....	400	408	4.0	19.1
Sept. 21.....	311	421	4.2	17.8
Oct. 26.....	205	3.3	4.3	16.5
Nov. 25.....	158	305	4.6	14.3
Dec. 27.....	96	335	4.9	16.5

Cowansville, Que.

The testing by the Department has been available for the full 12 months at every centre where an association was organized. In the vicinity of Cowansville are some farmers who ship cream daily all winter to Montreal, 57 miles distant. Thus, with a fair proportion of cows coming in fresh through the winter months, it might reasonably be expected that a liberal advantage would be taken of the opportunity for free testing. A fair number of men sent samples for eight and nine months, only a few for ten, eleven and twelve months. It is hoped that as the value of this systematic weighing and testing becomes more apparent to dairy farmers, a greatly increased number of samples will be sent in.

Looking at the records of milk produced in 9 months, it is found that the highest yield in herd 4 is from the 4-year-old cow No. 9, giving 4,910 pounds, while in herd 13 the 7-year-old cow No. 2 gave 6,960 pounds, or 2,050 pounds more. In herd 6 is a 5-year-old cow giving only 3,335 pounds of milk in the 9 months, throwing into strong relief the fact that the 5 cows in herd 13, milking 9 months, average 6,696 pounds each, or more than double.

For the same period of 9 months, the contrast in yield of fat is still greater. Herd 13 is still easily ahead, the production running from 226 to 262 pounds of fat per cow; but in others it runs no higher than 146 pounds as the best yield of any one cow in the herd, and drops as low as 123 pounds from a 5-year-old-cow. Amongst those milking 10 and 11 months, herds 13, 28 and 31 have some good individual yields of 236, 243 and 203 pounds of fat, while herd 27 has a record breaker in the 6-year-old half Jersey cow No. 4 giving 8,830 pounds of milk containing 400.4 pounds of fat. Such gratifying amounts are the result of definite breeding for a purpose and judicious feeding, as opposed to random methods.

The records of herd 19 furnish a telling illustration of the difference in yield from animals in the same herd. In one month there was a difference between 2 animals of 386 pounds of milk and 12 pounds of fat, and in 10 herds the difference runs over 200 pounds of milk. It is not simply the 2-year-old heifers or farrow cows that are responsible for the low yields. Frequently the 5, 6 and 8-year-olds, or over, are the defaulters. In herd 20 it may be noticed that the 2-year-old heifer No. 14 is ahead, in the matter of fat production, of 4 others older than herself, all freshening in the spring of 1906. This points again to the individuality of an animal and the necessity for its study.

In herd 4, cow No. 8, a 4-year-old, gives 210.1 pounds of fat in 8 months; but cow No. 4, 8 years old, gives only 139.9 pounds in 9 months. Similarly, in herd 6 notice 154.1 pounds of fat in 8 months and only 123.4 pounds in 9 months.

In herd 3 the five cows tested 7 months give a total yield of 13,012 pounds of milk; but in herd 12 five cows in 7 months have to their credit a production of 18,192 pounds.

TABLE XV. --TOTAL PRODUCTION OF INDIVIDUAL COWS, COWANSVILLE, QUE.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months tested.	Milk.	Fat.
						Lbs.	Lbs.
3	1	'Scrub'.....		March 2, 1906..	5	1,750	61.7
	5	".....		April 22, 1903..	5	2,350	85.5
	6	".....		May 13, 1906..	6	2,495	85.8
	8	Grade Jersey....	.4	April 25, 1906..	6	2,375	95.5
	7	Grade Guernsey....	4	" 20, 1906..	7	1,767	66.1
	10	'Scrub'.....		June 1, 1906..	7	2,755	99.5
	2	".....		April 15, 1906..	7	2,850	105.7
	9	".....		" 25, 1906..	7	2,265	110.4
	4	".....		" 24, 1906..	7	3,375	124.0
	3	".....		" 15, 1906..	8	3,020	117.5
4	14	Grade.....	2	" 5, 1906..	7	2,630	106.1
	15	".....	2	" 7, 1906..	7	2,730	110.9
	6	".....	9	" 6, 1906..	8	4,860	166.2
	7	".....	7	" 12, 1906..	8	4,720	194.9
	8	".....	4	" 25, 1906..	8	5,331	210.1
	13	".....	3	March 10, 1906..	9	3,920	135.3
	1	".....	8	" 13, 1906..	9	3,745	139.9
	12	".....	3	" 16, 1903..	9	4,080	146.4
	11	".....	4	" 9, 1906..	9	3,858	156.1
	1	".....	5	" 12, 1906..	9	4,260	160.4
	10	".....	4	" 20, 1906..	9	4,250	163.1
	5	".....	8	" 16, 1906..	9	4,690	161.8
	2	".....	9	" 6, 1906..	9	4,874	178.6
	3	".....	11	Feb. 20, 1906..	9	4,850	186.0
	9	".....	4	" 26, 1906..	9	4,910	193.5
6	2	".....	14	April 19, 1906..	6	2,130	80.6
	7	Grade Jersey....	4	May 24, 1906..	7	2,432	104.1
	4	Grade Durham....	9	" 19, 1906..	7	4,090	146.9
	8	".....	4	March 8, 1906..	8	2,850	110.2
	9	Grade Jersey....	4	" 19, 1906..	8	2,920	116.7

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TABLE XV.--TOTAL PRODUCTION OF INDIVIDUAL COWS, COWANSVILLE, QUE.
—Continued.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months tested.	Milk.	Fat.
						Lbs.	Lbs.
6	6	Grade Durham.....	8	March 17, 1906..	8	4,310	154.1
	1	".....	5	" 19, 1906..	9	3,335	123.4
	5	".....	9	" 17, 1906..	9	3,652	143.6
	3	Grade Jersey.....	5	April 2, 1906..	9	3,592	146.4
7	4	Grade Ayrshire.....	4	July 20, 1906..	5	2,575	97.0
	9	Grade Durham.....	8	April 26, 1906..	6	3,760	119.2
	5	Grade Jersey.....	14	March 2, 1906..	6	3,055	128.1
	6	Grade Holstein.....	14	May 15, 1906..	7	3,705	138.4
	3	Grade Ayrshire.....	9	Feb. 23, 1906..	7	4,570	161.2
	10	Grade Durham.....	8	April 28, 1906..	8	4,210	159.3
	7	Grade Ayrshire.....	6	" 7, 1906..	8	4,417	181.9
	2	".....	2	Feb. 28, 1906..	9	2,900	114.1
	1	".....	3	March 26, 1906..	9	3,280	162.2
8	8	".....	6	" 22, 1906..	9	4,470	181.0
	9	Ayrshire.....	7	May 9, 1906..	7	3,880	146.4
	11	".....	6	June 14, 1906..	7	4,410	171.8
	8	".....	2	April 1, 1906..	9	2,380	110.6
	13	Holstein.....	3	" 17, 1906..	9	3,058	130.9
	14	Ayrshire.....	5	March 29, 1906..	9	4,010	156.6
	5	".....	13	" 26, 1906..	9	3,920	158.0
	1	".....	5	April 2, 1906..	9	5,410	194.7
	4	".....	13	" 5, 1906..	9	5,460	208.8
	12	".....	4	March 10, 1906..	10	4,812	187.0
	3	".....	12	May 22, 1906..	10	4,950	190.7
	6	".....	8	March 16, 1906..	10	5,205	199.2
	10	".....	7	" 17, 1906..	10	5,098	202.9
	14	Grade Guernsey.....	2	July 10, 1906..	6	2,435	106.8
	12	".....	4	June 25, 1906..	6	3,640	161.2
	13	".....	9	" 30, 1906..	6	4,135	193.0
9	11	".....	6	" 6, 1906..	7	3,530	142.6
	10	".....	3	" 5, 1906..	7	3,690	146.9
	9	".....	3	May 10, 1906..	8	4,545	182.9
	7	".....	2	March 27, 1906..	9	3,110	131.7
	3	".....	3	" 18, 1906..	9	3,920	135.2
	16	".....	9	Jan. 1, 1906..	9	4,135	167.6
	5	".....	4	March 27, 1906..	9	5,155	186.2
	1	".....	6	March 18, 1906..	9	5,120	188.5
	8	".....	9	April 5, 1906..	9	5,760	196.1
	2	".....	9	March 15, 1906..	9	4,925	212.0
	6	".....	8	Feb. 23, 1906..	9	5,160	221.4
	4	".....	6	March 18, 1906..	9	5,045	223.5
10	25	".....	4	May 10, 1906..	4	2,470	71.9
	22	".....	6	" 10, 1906..	4	2,418	79.9
	15	".....	10	April 16, 1906..	4	2,395	90.1
	20	".....	2	" 9, 1906..	5	1,810	72.9
	19	".....	7	" 1, 1906..	5	2,595	108.2
	1	Grade Holstein.....	7	March 14, 1906..	5	3,040	110.4
	12	".....	4	" 20, 1906..	6	2,390	86.2
	18	Grade Ayrshire.....	8	" 20, 1906..	6	2,705	95.3
	17	".....	6	" 21, 1906..	6	3,010	103.6
	8	Grade Holstein.....	5	" 13, 1906..	6	3,005	104.1
	13	".....	12	" 4, 1906..	6	3,085	110.7
	4	Grade Jersey.....	5	Feb. 26, 1906..	6	2,720	116.0
	14	" Ayrshire.....	9	March 14, 1906..	6	3,190	116.6
	16	" Jersey.....	4	" 16, 1906..	6	3,000	119.0
	6	" Holstein.....	9	Feb. 18, 1906..	6	3,310	120.8
	9	" Ayrshire.....	9	March 9, 1906..	6	3,315	120.8
	24	".....	7	May 14, 1906..	6	3,300	123.2
	7	Grade Ayrshire.....	5	March 21, 1906..	6	3,400	128.3
	10	".....	7	" 13, 1906..	6	3,045	118.8
	5	Grade Ayrshire.....	7	" 1, 1906..	6	4,070	140.0
	13	" Jersey.....	5	Feb. 20, 1906..	6	3,160	145.6

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TABLE XV. -TOTAL PRODUCTION OF INDIVIDUAL COWS, COWANSVILLE, QUE.
—Continued.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
12	11			March 27, 1906..	4	1,570	43 1
	4			" 19, 1906..	4	1,270	51 6
	25			May 10, 1906..	5	3,085	111 9
	3			April 21, 1906..	5	2,980	116 1
	8			May 13, 1906..	5	3,060	123 3
	19			" 1, 1906..	5	3,885	134 3
	35			April 5, 1906..	6	2,850	114 7
	12				6	2,940	118 9
	33			March 29, 1906..	6	3,230	122 1
	21			April 21, 1906..	6	3,350	125 5
	30			March 28, 1906..	6	3,485	127 9
	7			April 10, 1906..	7	3,528	114 6
	22			March 26, 1906..	7	3,090	116 0
	5				7	3,300	118 4
	13			Feb. 1, 1906..	7	2,985	119 7
	16			April 5, 1906..	7	4,074	131 6
	6			March 28, 1906..	7	3,510	133 3
	31				7	4,045	133 5
	29			April 2, 1906..	7	3,607	135 9
	27		9	March 28, 1906..	7	3,235	138 2
	23			April 11, 1906..	7	3,550	142 8
	28			" 5, 1906..	7	3,755	155 1
	34			March 22, 1906..	8	3,427	131 9
	20			Nov. 21, 1905..	8	3,875	146 7
	15			Feb. 1, 1906..	9	3,535	127 1
	18			" 1, 1906..	9	3,985	131 6
13	11	Jersey.....	12	March 1905..	4	980	54 8
	25	Ayrshire.....	4	April 1905..	5	3,120	111 1
	23	".....	11	May 1906..	5	3,820	135 9
	13	".....	7	Dec. 1905..	6	3,820	127 4
	19	".....	2	May 1906..	7	2,450	93 0
	15	Jersey.....	3	April 1906..	7	2,970	131 4
	21	".....	3	" 1906..	7	2,900	133 3
	27	Ayrshire.....	5	May 1906..	7	3,450	146 1
	7	Grade Ayrshire.....	4	" 1906..	7	3,820	158 4
	14	Ayrshire.....	12	Nov. 1905..	7	5,410	174 8
	5	".....	7	May 1906..	7	5,540	213 5
	9	Grade Ayrshire.....	6	Sept. 1905..	8	4,500	177 5
	17	Ayrshire.....	10	April 1906..	8	5,960	185 8
	16	Jersey.....	3	" 1906..	8	4,440	186 6
	8	Grade Ayrshire.....	6	June 1905..	8	4,650	192 3
	1	Grade Jersey.....	14	Dec. 1905..	8	4,200	212 9
	10	Ayrshire.....	8	March 19, 1906..	8	4,950	214 7
	4	Grade Ayrshire.....	6	June 1905..	8	5,040	214 8
	20	Ayrshire.....	7	Feb. 1906..	8	6,240	248 7
	2	Grade Ayrshire.....	7	" 1906..	9	6,960	226 4
	12	Ayrshire.....	10	Dec. 1905..	9	6,940	230 8
	22	".....	7	April 1906..	9	6,490	237 4
	3	Grade Ayrshire.....	7	Nov. 1905..	9	6,820	259 1
	24	Ayrshire.....	10	May 1906..	9	6,270	262 0
	18	".....	6	March 1906..	10	5,900	236 0
	26	".....	6	April 1906..	10	6,320	241 2
	6	Grade Ayrshire.....	7	Oct. 1905..	11	6,260	263 0
14	17		2	June 5, 1906..	4	2,130	75 7
	15	Grade Ayrshire.....	9	Farrow.....	4	1,880	79 4
	16	".....	8	June 5, 1906..	4	2,660	100 8
	14	".....	2	May 15, 1906..	5	1,834	71 0
	10	".....	3	April 30, 1906..	5	2,466	82 5
	11	".....	3	" 30, 1906..	5	2,355	85 2
	8	".....	3	" 27, 1906..	5	2,284	87 9
	12	".....	3	May 3, 1906..	5	2,390	91 3

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TABLE XV.—TOTAL PRODUCTION OF INDIVIDUAL COWS, COWANSVILLE, QUE.
—Continued.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
14	6	Grade Ayrshire	5	April 22, 1906..	5	2,660	103.3
	7	"	3	" 25, 1906..	5	2,336	103.6
	5	Grade Jersey	4	" 20, 1906..	5	2,620	107.6
	9	"	5	" 28, 1906..	5	2,525	110.4
	13	Grade Ayrshire	9	May 5, 1906..	5	3,552	131.9
	3	Ayrshire	8	Feb. 21, 1906..	6	2,970	108.6
	4	Grade Ayrshire	3	April 12, 1906..	6	2,290	112.4
	1	Grade Holstein	8	" 8, 1906..	6	4,965	142.1
	2	"	9	" 6, 1906..	6	4,527	166.8
16	14	Grade Ayrshire	3	March 19, 1905..	4	1,050	42.1
	16	Grade Holstein	6	Slinker.	4	1,355	47.6
	6	Grade Ayrshire	7	"	4	1,530	55.1
	3	"	4	Farrow.	4	1,255	56.4
	2	"	8	March 10, 1906	4	1,355	56.8
	25	"	9	" 24, 1906..	4	1,645	57.2
	30	"	9	" 26, 1906..	4	1,715	57.2
	4	"	6	" 1905..	4	1,475	58.0
	33	Grade Holstein	7	March 20, 1906..	4	1,749	61.3
	40	Grade Ayrshire	7	April 1906..	4	1,690	62.9
	1	"	7	2, 1905..	4	1,595	64.0
	23	Grade Holstein	7	March 22, 1906..	4	1,960	64.1
	29	Grade Durham	6	April 14, 1906..	4	1,870	64.6
	5	Grade Holstein	6	" 1906..	4	1,695	64.8
	32	Grade Ayrshire	8	" 4, 1906..	4	1,860	65.0
	22	"	8	March 11, 1906..	4	1,710	65.8
	35	Grade Durham	4	" 17, 1906..	4	1,770	66.9
	31	"	6	March 10, 1906..	4	1,785	67.9
	21	Grade Holstein	4	" 17, 1906..	4	1,630	69.3
	24	"	8	" 3, 1906..	4	2,185	70.8
	27	Grade Ayrshire	8	April 6, 1906..	4	2,055	71.3
	34	Grade Durham	6	" 2, 1906..	4	2,205	71.5
	9	"	8	" 7, 1906..	4	2,155	72.6
	8	Grade Holstein	9	March 14, 1905..	4	1,905	74.4
	36	Grade Ayrshire	5	April 10, 1906..	4	2,000	74.7
	7	Grade Holstein	8	March 10, 1906..	4	2,345	78.1
	10	"	9	" 20, 1906..	4	1,935	78.7
	28	"	7	" 30, 1906..	4	2,175	78.8
	26	Grade Ayrshire	7	" 26, 1906..	4	2,345	79.3
	13	Grade Holstein	6	Slinker...	4	2,470	79.5
	37	Grade Ayrshire	6	April 17, 1906..	4	2,020	82.1
	39	"	5	March 18, 1906..	4	2,130	82.1
	11	"	9	April 16, 1906..	4	2,620	82.5
	38	"	6	" 16, 1906..	4	2,160	89.0
	15	"	6	" 3, 1906..	4	2,130	98.4
19	18				5	2,250	80.4
	1				7	1,650	67.3
	17				7	2,370	85.4
	5				7	3,120	105.1
	3				7	2,890	112.4
	2				7	3,100	115.1
	6				7	2,780	116.9
	15				7	3,840	125.3
	13				7	3,400	125.9
	4				7	3,050	128.5
	8				7	2,660	139.9
	16				7	3,550	139.9
	14				7	3,910	149.1
	7				7	3,220	150.3
	12				7	4,260	151.6
	9				7	3,420	153.0
	10				7	3,770	158.4
	11				7	4,040	163.2

TABLE XV. TOTAL PRODUCTION OF INDIVIDUAL COWS, COWANSVILLE, QUE.
—Continued.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months tested.	Milk.	Fat.
						Lbs.	Lbs.
20	18	Grade Jersey.....	7	June 9, 1906..	4	2,192	103.1
	23	Durham.....	7	Feb. 12, 1906..	5	1,614	58.6
	11	Jersey.....	4	April 22, 1906..	5	2,559	105.9
	12	Grade Jersey.....	4	" 29, 1906..	5	2,670	107.7
	3	".....	3	" 28, 1906..	5	2,260	111.3
	13	".....	15	March 11, 1906..	6	2,215	75.4
	16	Jersey.....	2	" 1906..	6	1,780	80.3
	22	Ayrshire.....	3	" 1906..	6	2,120	96.8
	10	Grade Ayrshire.....	6	" 11, 1906..	6	2,870	105.9
	15	Ayrshire.....	8	April 5, 1906..	6	2,508	106.2
	17	Grade Ayrshire.....	6	" 1906..	6	2,910	106.2
	28	Jersey.....	6	March 1906..	6	2,840	118.4
	25	Ayrshire.....	9	April 5, 1906..	6	3,150	129.1
	30	Ayrshire-Jersey.....	3	May 1905..	7	1,510	59.8
	21	Ayrshire-Durham.....	5	" 1905..	7	1,670	71.1
	20	Grade Ayshire.....	3	March 11, 1906..	7	2,640	98.7
	4	Pure Jersey.....	7	Feb. 7, 1906..	7	2,250	114.9
	26	Grade Jersey.....	15	May 8, 1906..	7	2,891	118.1
	24	Grade Devon.....	7	March 2, 1906..	7	3,321	121.1
	14	Grade Jersey.....	2	" 9, 1906..	7	2,666	122.0
	6	Grade Ayrshire..	6	Nov. 30, 1905..	7	3,110	131.2
	27	Grade Jersey.....	4	March 8, 1906..	7	3,015	132.6
	29	Grade Ayrshire.....	6	Feb. 26, 1906..	7	3,130	133.5
	8	Grade Jersey.....	8	March 1, 1906..	7	3,320	147.7
	19	".....	6	Feb. 15, 1906..	8	2,608	105.6
	1	Jersey.....	4	Nov. 22, 1905..	8	2,710	124.0
	2	Grade Jersey.....	4	Jan. 19, 1906..	8	2,870	133.1
	5	".....	9	Dec. 27, 1905..	9	3,650	188.3
21	14	.....	4	May 12, 1906..	5	2,060	83.1
	15	.....	12	" 17, 1906..	5	2,580	99.6
	16	.....	9	" 21, 1906..	5	2,695	106.9
	11	Grade.....	2	April 13, 1906..	6	1,825	73.9
	13	".....	10	May 3, 1906..	6	2,930	116.2
	10	".....	6	April 10, 1906..	6	2,850	117.4
	12	".....	7	" 27, 1906..	6	3,320	134.1
	4	Grade Jersey.....	9	March 9, 1906..	7	2,585	101.8
	9	Grade.....	10	" 22, 1906..	7	3,000	114.7
	8	".....	10	" 21, 1906..	7	3,160	133.1
	6	Grade Jersey.....	8	" 16, 1906..	8	2,965	117.5
	2	Grade.....	5	" 1, 1906..	8	3,175	119.3
	5	Grade Jersey.....	3	" 21, 1905..	8	3,185	130.5
	1	Grade Holstein-Jersey.....	9	April .., 1905..	8	3,310	135.4
23	7	Grade.....	5	March 16, 1906..	8	3,880	162.0
	3	".....	6	" 7, 1906..	8	4,440	164.1
	8	.....			4	2,020	61.8
	12	.....	3	March 9, 1906..	4	2,080	73.9
	14	.....			4	2,290	74.8
	16	.....		March 11, 1906..	4	2,216	77.4
	9	.....		" 10, 1906..	4	2,140	81.0
	13	.....		" 8, 1906..	4	2,752	84.1
	18	.....		" 7, 1906..	4	2,467	84.7
	7	.....		" 10, 1906..	4	2,492	86.4
25	5	Ayrshire.....	3	Jan. 1, 1906..	6	3,098	99.6
	4	".....	7	Dec. 10, 1905..	6	3,560	118.6
	11	Grade Holstein.....	2	April 19, 1906..	5	2,640	87.7
	10	Grade Jersey.....	3	" 14, 1906..	6	2,835	104.6
	12	Grade Ayrshire..	5	" 24, 1906..	6	3,275	134.5
	8	Grade Durham.....	3	March 30, 1906..	7	3,355	101.7
	9	Grade Jersey.....	3	April 1, 1906..	7	3,550	123.6
	6	Grade Holstein.....	5	March 17, 1906..	7	4,200	124.7

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TABLE XV.—TOTAL PRODUCTION OF INDIVIDUAL COWS, COWANSVILLE, QUE.
—Continued.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months tested.	Milk	Fat.
						Lbs.	Lbs.
25	7	Grade Jersey.....	7	" 23, 1906..	7	3,710	153.4
	4	".....	4	Feb. 2, 1906..	8	4,530	153.4
	2	".....	6	Dec. 14, 1905..	9	3,500	158.2
	1	".....	10	" 6, 1905..	9	4,350	167.6
	3	Grade Holstein.....	9	Jan. 24, 1906..	9	6,945	191.1
27	1	Grade.....	9	May 2, 1905..	7	3,685	154.4
	18	$\frac{1}{2}$ Jersey.....	4	Feb. 26, 1906..	8	5,210	222.0
	12	".....	6	" 1, 1906..	8	5,270	261.5
	16	".....	2	April 15, 1906..	9	4,050	174.5
	13	Jersey.....	2	March 31, 1906..	9	4,505	206.3
	21	".....	3	May 9, 1905 } Nov. 4, 1906 }	10	3,935	222.8
	9	$\frac{1}{2}$ Jersey.....	7	Feb. 1, 1906..	10	6,120	264.1
	2	Half Jersey....	10	{ March 17, 1905 } { " 21, 1906 }	10	8,095	375.7
	4	".....	6	Feb. 26, 1906..	10	8,830	400.4
	6	Grade Jersey.....	3	{ April 22, 1905 } { Sept. 21, 1906 }	11	4,370	210.0
	19	Jersey.....	4	{ " 5, 1905 } { Oct. 10, 1906 }	11	3,610	219.2
	14	Grade Jersey.....	5	Jan. 30, 1906..	11	5,985	268.1
	3	".....	5	{ Aug. 24, 1905 } { Oct. 21, 1906 }	11	5,090	276.5
	17	Jersey.....	4	{ April 14, 1905 } { Oct. 5, 1906 }	11	5,755	281.3
	15	".....	4	{ April 7, 1905 } { Oct. 2, 1906 }	11	6,045	291.4
	11	Half Jersey.....	11	{ Dec. 17, 1905 } { Oct. 31, 1906 }	11	8,810	336.2
	8	Jersey ..	8	{ Jan. 15, 1906 } { Dec. 22, 1906 }	11	6,930	355.4
	5	Half Jersey.....	9	{ Nov. 15, 1905 } { Oct. 19, 1906 }	11	8,275	408.6
	10	Jersey.....	2	{ Nov. 1, 1905 } { Oct. 9, 1906 }	12	4,190	200.5
	20	Half Jersey....	3	{ March 7, 1905 } { " 17, 1906 }	12	4,595	210.9
	22	".....	5	Nov. 22, 1905..	12	5,100	300.7
	7	".....	7	{ Nov. 9, 1905 } { Oct. 22, 1906 }	12	5,620	305.8
28	12	Guernsey.....	3	Aug. 1, 1906..	4	2,765	119.3
	2	".....	8	March 3, 1905..	5	1,450	55.1
	22	Ayrshire.....	3	Aug. 9, 1905..	8	2,880	105.6
	9	Pure Guernsey.....	3	June 25, 1906..	8	2,605	122.9
	15	Grade Durham.....	4	April 9, 1906..	8	3,430	151.1
	6	Pure Guernsey.....	5	{ Feb. 19, 1905 } { June 10, 1906 }	8	3,560	155.3
	14	Guernsey.....	2	April 13, 1906..	9	1,925	87.4
	13	".....	2	" 19, 1906..	9	2,648	120.8
	11	".....	2	" 12, 1906..	9	2,870	140.0
	5	".....	9	March 23, 1906..	9	3,490	152.1
	7	".....	5	" 22, 1906..	9	3,405	153.3
	20	French Grade..	7	Feb. 18, 1906..	9	4,755	177.1
	17	".....	7	April 14, 1906..	9	4,195	201.3
	10	Guernsey.....	4	{ March 25, 1905 } { April 6, 1906 }	10	3,565	166.9
	8	".....	4	March 15, 1906..	10	3,950	189.1
	21	"Scrub".....	8	" 11, 1906..	10	5,065	191.6
	18	French Grade.....	6	" 7, 1906..	10	4,586	195.2
	23	Ayrshire.....	9	Feb. 25, 1905..	10	6,125	243.1

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TABLE XV.—TOTAL PRODUCTION OF INDIVIDUAL COWS, COWANSVILLE, QUE.
—Concluded.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months tested.	Milk.	Fat.
						Lbs.	Lbs.
28	1	Guernsey.....	6	(Aborted Dec., 1905	11	3,915	187·0
	19	French Grade.....	7	(Aborted May, 1905	11	4,635	190·8
29	5	.....			5	1,670	75·5
	6	.....			5	2,400	88·8
	12	.....			6	1,755	78·0
	8	.....			6	1,865	85·8
	11	.....			6	2,110	93·6
	10	.....			6	2,730	104·9
	9	.....			7	2,080	85·6
	3	.....			7	2,400	102·4
	7	.....			7	2,615	104·4
	4	.....			7	2,020	106·1
	1	.....			7	3,100	137·6
	2	.....			7	3,425	139·2
31	4	Grade Holstein.....	5	Aug. 18, 1905..	5	2,140	69·9
	19	Grade Jersey.....	5	June 30, 1906..	6	2,580	120·6
	18	Grade Holstein.....	3	" 8, 1906..	7	3,500	125·3
	13	Grade Jersey	7	March 24, 1906..	7	4,020	160·4
	17	Grade Holstein	8	May 15, 1906..	8	4,416	155·1
	5	"	4	Aug. 23, 1905..	9	4,020	140·6
	16	Grade Jersey.....	7	April 7, 1906..	9	3,640	156·1
	3	Grade Holstein.....	5	Aug. 17, 1905..	9	4,240	163·4
	12	"	7	March 13, 1906..	9	5,290	190·5
	14	"	6	" 29, 1906..	9	4,700	192·3
	15	Grade Jersey	8	April 3, 1906..	9	5,290	207·0
	1	Grade Holstein	5	May 25, 1906..	10	4,564	161·6
	8	Reg. Holstein.....	3	Jan. 8, 1906..	10	5,430	162·3
	9	Grade Holstein.....	5	Feb. 8, 1906..	10	5,210	175·1
	11	Grade.....	11	March 7, 1906..	10	4,930	175·3
	10	Grade Holstein	5	Feb. 17, 1906..	10	5,220	179·7
	2	"	7	Aug. 16, 1905..	10	4,760	203·8
	6	"	6	Sept. 9, 1905..	11	3,870	185·5
32	23	.....	5	March 29, 1906..	4	2,370	80·4
	21	.....	4	" 22, 1906..	4	2,655	83·0
	20	.....	4	" 22, 1906..	4	2,745	89·7
	22	.....	6	" 25, 1906..	4	2,595	90·7
	18	.....	10	" 22, 1906..	4	3,045	104·1
	16	.....	10	" 17, 1906..	4	3,030	110·7
	19	.....	7	" 22, 1906..	4	3,340	112·0
	17	.....	8	" 22, 1906..	4	3,715	121·4
	24	.....	10	April 5, 1906..	4	3,965	129·6
	2	.....	6	Nov. 6, 1906..	5	2,995	98·9
	11	.....	5	Feb. 26, 1906..	5	3,140	106·1
	10	.....	5	" 25, 1906..	5	3,485	114·8
	15	.....	7	March 14, 1906..	5	3,626	118·0
	12	.....	8	" 2, 1906..	5	3,682	122·0
	3	.....	8	Nov. 7, 1905..	5	3,220	125·9
	14	.....	10	March 12, 1906..	5	3,970	130·0
	4	.....	6	Nov. 8, 1905..	5	3,725	132·1
	9	.....	4	Feb. 10, 1906..	5	3,885	132·7
	7	.....	9	" 8, 1906..	5	3,685	133·0
	1	.....	10	Nov. 6, 1905..	5	3,460	134·2
	6	.....	10	Feb. 9, 1906..	5	3,620	137·9
	13	.....	13	March 4, 1906..	5	4,493	153·0
	8	.....	8	Feb. 17, 1906..	5	4,325	156·3
	5	.....	7	Dec. 4, 1905..	5	4,675	165·7

The accompanying three pairs of illustrations of cows are photographs of six animals in three herds in the North Oxford Association, whose individual records are respectively the highest and lowest in each herd during the period tested. It will be interesting to study the appearance of each pair while comparing their yields of milk and butter fat.

These photographs were taken in May, 1907, as this report goes to press.



FIG I.—Cross-bred Ayrshire-Jersey Cow No. 9 in herd 10, North Oxford Association, calved March 25, age 4; yield 6,570 lbs. milk in 9 months, 262.2 lbs. fat.



FIG II.—Grade Ayrshire Cow, No. 8, in herd 10, North Oxford Association, calved March 31, age 4; yield 4,590 lbs. milk in 9 months, 164.2 lbs. fat.



FIG. I.—Common grade, No. 3, in herd 12, North Oxford Association, calved March 22, age 9;
yield 5,390 lbs. milk in 7 months, 240 8 lbs. fat.

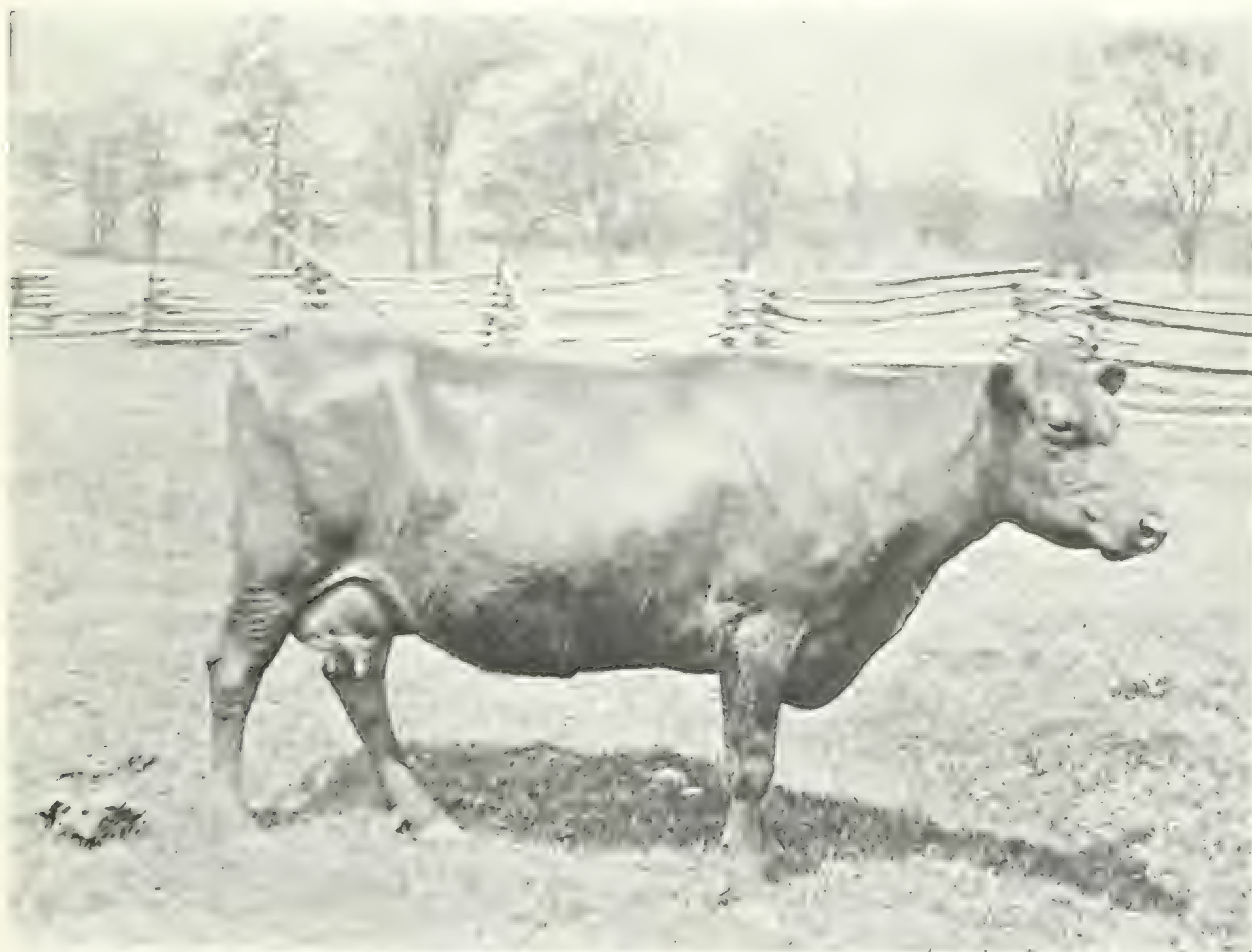


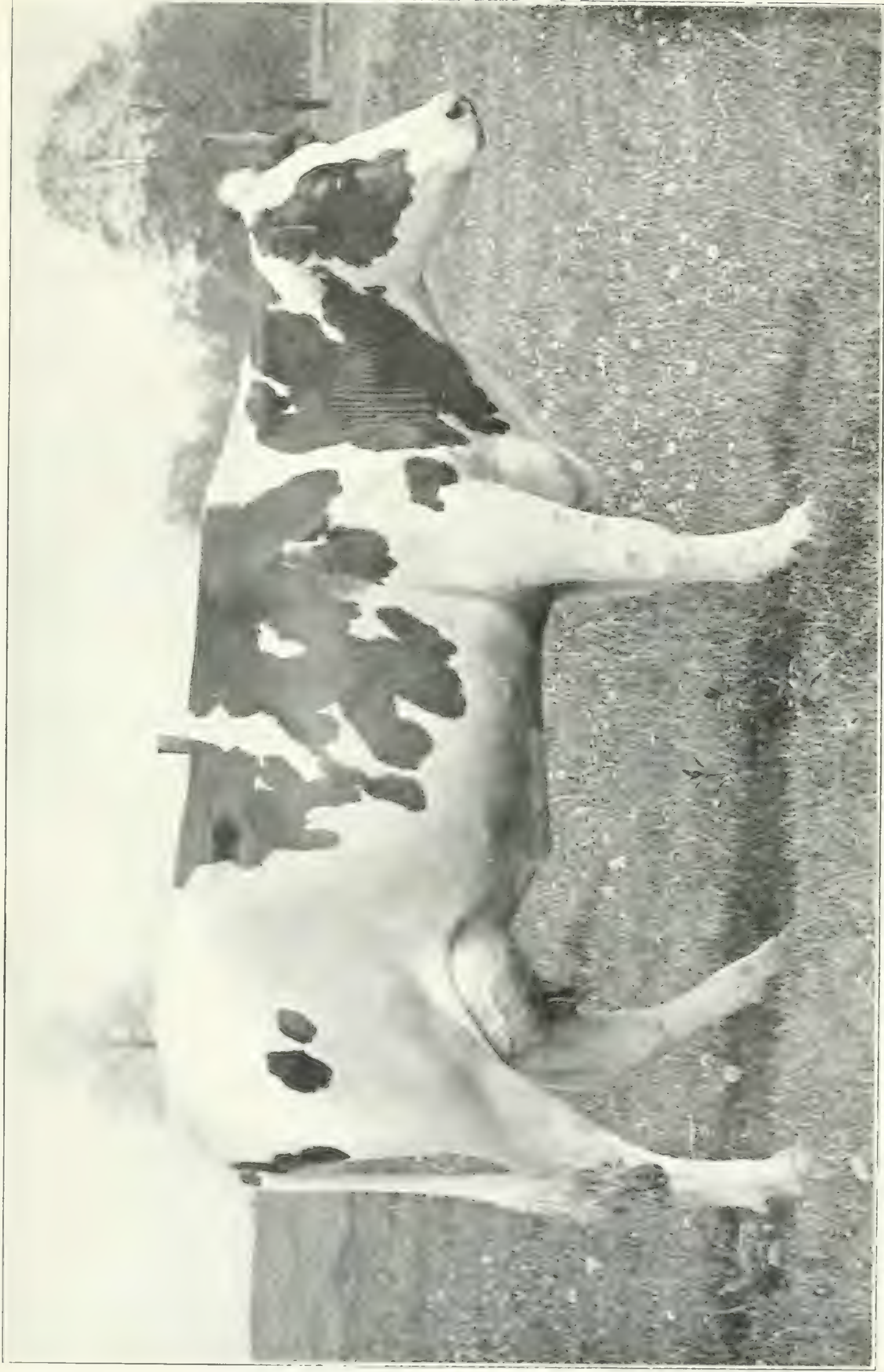
FIG. II.—Common grade cow, No. 6 in herd 12, North Oxford Association. Calved March 9,
age 11; yield 4,290 lbs. milk in 7 months, 146 lbs. fat.



FIG. I. Holstein Cow No. 8, in herd 14, North Oxford Association, calved March 24, Age 10; yield 9660 lbs. milk in 8 months, 3273 lbs. fat.



FIG. II. Holstein Cow No. 14, in herd 14, North Oxford Association, calved April 13, age 8; yield 7,273 lbs. milk in 8 months, 211.8 lbs. fat.



Holstein Cow, No. 25 in herd 2, North Oxford Association. Record as a two year old 11,155 lbs. milk, 379 2 lbs. fat. Value of milk \$115.54.

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TABLE XVI. ANNUAL YIELDS—2 HERDS OF TEN GRADE COWS EACH, COWANSVILLE, QUE.

		Grade Holsteins.			Grade Jerseys
		lbs. milk. lbs. fat.			Lbs. milk. Lbs. fat.
April.....		6,480 208 2	April.....		7,900 346 2
May.....		6,186 219 1	May.....		7,575 335 2
June.....		7,000 255 2	June.....		7,300 354 6
July.....		6,200 237 0	July.....		6,380 297 0
August.....		5,210 208 1	August.....		4,900 247 3
September.....		4,300 184 9	September.....		3,295 161 9
Total.....		36,446 1,312 5	Total.....		37,350 1,742 2
October.....		3,430 134 6	October.....		3,575 169 5
November.....		1,800 92 8	November.....		3,680 259 5
December.....		800 18 0	December.....		5,430 292 2
January.....			January.....		4,250 204 4
February.....		1,750 53 0	February.....		6,600 308 8
March.....		3,670 112 9	March.....		6,940 308 6
Total.....		11,600 441 3	Total.....		32,510 1,543 0
Paying by 100 lbs. milk.			Paying by 100 lbs. milk.		
Winter: 11,600 at \$1.10.....		\$127 60	Winter: 32,510 at \$1.10.....		\$357 61
Summer: 36,446 at 80c.....		291 57	Summer: 37,350 at 80c.....		298 80
Total.....		\$419 17	Total.....		\$656 41
Difference.....			Difference.....		\$237 24
Paying by fat.			Paying by fat.		
Winter: 441 = 507 lbs. butter at 22c....		\$115 54	Winter: 1,543 lbs. = 1,775 lbs. butter at 22c.		\$390 50
Summer: 1,312 lbs. = 1,509 lbs. butter at 20c.		301 80	Summer: 1,742 lbs. = 2,604 " 20c.		400 80
		\$417 34			\$791 30
Difference.....			Difference.....		\$373 96

The object of the figures in Table XVI. is to compare the annual return from two herds of grade cows in the Cowansville association. These herds were selected because it was noticed that the total yield of milk from each lot of 10 cows for the first six months was so close, 36,446 pounds and 37,350 pounds.

The yield for the second six months is widely different, 11,600 against 32,510 pounds.

Assuming that the milk is paid for by weight and allowing \$1.10 for winter and 80 cents per 100 pounds as the summer price, the herd of grade Jerseys earns \$237.24 more than the other herd during the year.

Again, assuming that the milk is paid for according to its fat content, and allowing 115 pounds of butter to 100 pounds of fat, and valuing butter at 22 cents for the winter six months, and 20 cents per pound for the summer six months, there is a net gain of \$373.96 of the one herd over the other.

Further, apart from the question of breed altogether, it should be noticed that the one man is evidently feeding and breeding for winter production when prices are highest. That it pays him well to so arrange matters is evidenced by the fact that the winter milk in the one case sells for \$230.01 more than in the other; or the winter fat from the one herd brings in \$274.96 more than the other. If any figures convey a lesson, surely these do.

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TABLE XVII.—DIFFERENCE BETWEEN INDIVIDUAL COWS IN THE SAME HERDS, COWANSVILLE, QUE.

Herd Number.	Number of Months Yield.	DIFFERENCE BETWEEN HIGHEST AND LOWEST YIELDS.		Age of Cow with Lowest Yield.
		Pounds of Milk.	Pounds of Fat.	
32	5	1,680	66·8	6
10	6	1,350	24·0	5
14	6	2,010	33·5	8
6	8	940	32·1	4
8	8	1,520	49·5	13
9	8	1,855	60·5	3
1	9	1,165	53·6	8
27	10	3,675	41·7	5

Table 17 emphasizes the point that the individuality of a cow must be considered in building up a profitable dairy herd. In 8 herds are shown the *differences* between the highest and lowest yields of milk and butter fat.

In herd 6 the best cow gave during 8 months 940 pounds of milk, containing 32·1 pounds of fat, *more* than the 4-year-old poorest cow. That difference, large enough as it is, is nearly doubled in herd 9, where the 3-year-old gives 60·5 pounds of fat less than the best cow.

In herd 27, the difference is 3,675 pounds of milk in ten months, while in herd 32 the difference is actually 66·8 pounds of fat in only 5 months. The indications, from the records of this association, are that there is plenty of room for judicious selection. For instance, in one herd a 4-year-old cow in 8 months gave 5,330 pounds of milk and 210 pounds of fat, but an 8-year-old in 9 months gave only 3,745 pounds of milk and 140 pounds of fat. Thus with one month's longer opportunity she gave 70 pounds of fat less than the other.

Similar differences occur in many other herds, and such sharp contrasts indicate how imperative it is to test for fat and to weed out the poor cows.

TABLE XVIII.—AVERAGE YIELDS OF 30 DAY PERIODS, 1906, MANSONVILLE QUE

30 Days ending.	Total number of Cows.	AVERAGE.		
		Pounds of Milk.	Test.	Pounds of Fat.
May 27	115	470	3·9	18·3
June 27	262	589	3·8	22·6
July 27	299	555	4·0	22·5
August 27	251	492	4·1	19·7
September 28 ..	80	435	4·3	18·8
October 26 ...	60	378	4·5	17·3

MANSONVILLE, QUE.

In herd 3 the average yield is 3,144 pounds of milk in 5 months, but in herd 13 the average is only 2,336 pounds in that time. A simple calculation indicates that if the cows in herd 13 produced as much as those in herd 3, there would be a total yield of 6,400 pounds of milk more, or *practically 200 pounds of butter more in five months*. Another \$42 from 8 cows in that short time would be a more satisfactory income.

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Telling as such a contrast is, that between herds 4 and 6 is greater. If as good as those in herd 6, the 16 cows in herd 4 would have made 224 pounds more butter in 4 months, and would have netted over \$47 more for their owner.

In herd 1 the average yield is 2,750 pounds of milk in 5 months. Had they been as good producers as herd 3, 14 cows would have done as much work and brought as much profit as 21. There is a distinct saving to the farmer in time, energy and feed, through keeping better stock.

TABLE XIX.—TOTAL PRODUCTION OF INDIVIDUAL COWS—MANSONVILLE, QUE.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months tested.	Milk.	Fat.
						Lbs.	Lbs.
1	20		3	Feb. 20, 1905..	4	1,490	63·9
	29				4	1,970	70·3
	14		7	Jan. 12, 1906..	4	2,480	94·8
	1		10	March 13, 1906..	4	2,240	96·2
	2		5	Dec. 25, 1905..	4	2,210	99·6
	19		3	March 15, 1906..	5	1,850	74·5
	3		3	" 20, 1905..	5	1,490	77·3
	25		2	April 7, 1906..	5	1,920	79·2
	22		7	March 20, 1906..	5	2,350	90·5
	26		2	April 7, 1906..	5	2,430	91·2
	21		3	March 6, 1906..	5	2,460	99·8
	17		7	Feb. 25, 1906..	5	2,600	101·7
	4		2	April 1, 1906..	5	2,550	103·1
	5		8	March 8, 1906..	5	3,160	107·8
	18		6	" 27, 1906..	5	2,970	108·1
	16		7	Feb. 10, 1906..	5	2,760	109·4
	27		7	April 7, 1906..	5	3,210	112·4
	11		6	March 12, 1906..	5	2,960	118·0
	9		7	April 1, 1906..	5	3,100	120·7
	10		6	March 20, 1906..	5	3,220	123·7
	12		6	" 10, 1906..	5	3,400	124·0
	6		8	" 1, 1906..	5	3,280	127·5
	8		9	" 1, 1906..	5	2,800	128·6
	7		9	" 4, 1906..	5	3,380	131·3
	13		7	" 12, 1906..	5	3,190	135·8
	15		7	" 10, 1906..	5	3,260	137·0
3	5	Guernsey	3		5	2,600	99·3
	7	Durham	9		5	2,510	101·4
	10	Guernsey	7		5	2,645	105·3
	2	"	2		5	2,675	111·8
	1	"	2		5	2,585	121·3
	14	Durham	9		5	3,290	121·8
	8	"	9		5	3,145	122·4
	12	"	6		5	3,825	125·2
	15	"	6		5	3,175	125·3
	11	Grade	12		5	3,545	130·2
	4	Guernsey	3		5	2,845	133·2
	9	Durham	9		5	2,825	138·1
	6	Durham Holstein	8		5	3,610	144·5
4	3	Grade	9		5	3,525	145·1
	6	Durham Holstein	8		5	3,610	144·5
	13	Guernsey	6		5	3,745	145·7
	18	Durham	2	March 28, 1906..	4	1,080	39·3
	4	"	3	April 1905..	4	1,190	55·2
	17	"	2	May 18, 1906..	4	1,310	60·3
	5	"	2	" 9, 1906..	4	1,760	66·5
	15	"	7	Nov. 1905..	4	1,640	60·9
	1	"	3	April 25, 1906..	4	1,840	72·5
	8	"	4	Jan. 10, 1906..	4	1,940	75·5
	10	Holstein	5	Feb. 2, 1906..	4	2,090	78·6
	7	Durham	3	April 5, 1906..	4	1,930	79·0

TABLE XIX.—TOTAL PRODUCTION OF INDIVIDUAL COWS, MANSONVILLE, QUE.
—Continued.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months tested.	Milk.	Fat.
						Lbs.	Lbs.
4	13	Durham.	8	Dec. 1905.	4	2,100	79.1
	12	"	14	April 5, 1906.	4	2,140	80.5
	16	"	3	Feb. 9, 1906.	4	1,990	81.8
	9	"	4	Jan. 2, 1906.	4	2,050	82.7
	11	"	4	" 1, 1906.	4	2,030	88.9
	14	"	7	" 10, 1906.	4	2,250	93.3
	6	"	5	May 9, 1906.	4	2,740	104.6
6	17	Grade	3	May 1, 1906.	4	1,482	53.1
	20	"	2	April 27, 1906.	4	1,610	63.2
	18	"	2	" 28, 1906.	4	1,725	66.7
	19	"	2	" 26, 1906.	4	1,645	67.5
	16	"	3	May 7, 1906.	4	2,007	76.6
	5	"	5	March 8, 1906.	4	2,035	79.3
	15	"	4	April 10, 1906.	4	2,300	80.6
	10	"	4	" 5, 1906.	4	2,540	81.0
	12	"	3	May 3, 1906.	4	2,347	84.9
	9	"	3	April 3, 1906.	4	2,315	85.2
	4	"	6	Feb. 6, 1906.	4	2,195	86.8
	13	"	8	May 6, 1906.	4	2,077	87.9
	21	"	8	" 6, 1906.	4	2,152	88.5
	14	"	4	April 20, 1906.	4	2,325	91.1
	7	"	6	Feb. 28, 1906.	4	2,374	92.1
	2	"	4	March 6, 1906.	4	2,395	93.5
	8	"	5	Feb. 28, 1906.	4	2,395	98.3
	1	"	6	" 7, 1906.	4	2,840	102.0
	11	"	4	April 3, 1906.	4	2,535	102.5
	3	"	8	Feb. 6, 1906.	4	2,585	105.8
	6	"	6	" 28, 1906.	4	2,680	111.3
7	10	Grade Durham.	2	May 8, 1906.	4	1,693	69.1
	12	"	3	April 1906.	4	1,410	61.4
	9	"	2	" 1906.	4	1,880	66.8
	13	" Jersey	5	" 1906.	4	1,985	75.6
	2	" Ayrshire.	10	March 1906.	4	2,070	81.4
	3	"	13	" 1906.	4	2,255	81.4
	4	" Durham-Jersey.	8	April 1906.	4	2,210	81.8
	8	" Holstein.	8	March 1906.	4	2,180	85.2
	7	"	9	" 1906.	4	2,470	87.2
	1	" Jersey.	8	" 1906.	4	2,340	87.9
	5	" Holstein.	9	May 21, 1906.	4	2,705	91.0
	6	"	8	March 1906.	4	2,535	95.0
12	2	" Jersey.	8	Sept. 1905.	4	1,810	82.0
	5	"	5	Feb. 1906.	4	2,390	113.3
13	8	"	9	March 1906.	4	1,740	72.9
	11	" Jersey.	3	Nov. 1905.	5	1,330	65.0
	5	" Guernsey.	2	May 2, 1906.	5	2,650	92.7
	4	" Durham.	4	March 1906.	5	2,530	95.5
	3	" Guernsey	4	Feb. 6, 1906.	5	2,230	106.2
	7	" Jersey.	4	" 1906.	5	2,000	100.7
	1	" Guernsey.	4	April 1906.	5	2,550	111.0
	2	"	4	" 1906.	5	2,470	112.1
	9	" Jersey.	5	Feb. 1906.	5	2,835	123.7
18	6	"			4	1,200	44.2
	5	"			4	1,330	50.1
	4	"			4	1,480	60.3
	7	"			4	1,620	64.0
	2	"			4	1,430	64.9
	9	"			4	1,970	71.2

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TABLE XIX.—TOTAL PRODUCTION OF INDIVIDUAL COWS, MANSONVILLE, QUE.
—Concluded.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months tested.	Milk.	Fat.
						Lbs.	Lbs.
18	13				4	1,720	72.2
	1				4	1,740	72.6
	3				4	1,590	73.2
	16				4	1,790	74.2
	12				4	1,940	75.3
	14				4	2,030	84.2
	11				4	2,190	85.2
	8				4	2,400	85.6
	15				4	2,210	90.1
19	30				4	1,060	49.5
	34				4	1,400	49.4
	36				4	1,070	49.7
	31				4	1,240	52.1
	31				4	1,255	54.2
	32				4	1,020	56.7
	24				4	1,310	64.8
	13				4	1,615	69.5
	29				4	1,800	70.5
	22				4	1,460	73.6
	13				4	1,750	77.1
	11				4	1,460	81.4
	25				4	2,030	81.5
	20				4	2,065	86.7
	6				4	2,070	87.9
	7				4	2,185	88.5
	28				4	2,405	91.4
	4				4	2,020	92.5
	9				4	2,400	95.8
	8				4	2,410	97.8
	37				4	2,540	100.8
	26				4	2,360	102.2
	17				4	2,345	102.7
	19				4	2,385	103.9
	27				4	2,555	104.9
	17				4	2,430	105.0
	1				4	2,840	110.3
	15				4	2,530	111.0

TABLE XX.—AVERAGE YIELDS OF 30 DAY PERIODS, 1906, ST. ARMAND, QUE.

30 Day ending	Total number of Cows.	AVERAGE.		
		Pounds of Milk.	Test.	Pounds of Fat.
Mar. 22	128	482	3.9	19.2
Apr. 21	252	492	3.8	18.7
May 24	318	524	3.8	20.2
June 23	355	661	3.9	26.2
July 22	328	577	4.1	24.1
Aug. 22	314	511	4.1	21.2
Sept. 21	322	522	4.3	22.5
Oct. 21	281	471	4.5	21.4
Nov. 20	266	339	4.9	16.7
Dec. 20	153	295	4.7	13.8

St. Armand, Que.

Some of the records in herd 1 give particular point to the necessity of studying the individuality of each cow as opposed to resting content with a fair average production from the whole herd. Looking at the group of cows tested for 8 months and considering only the question of age, it is noticed that the 3-year-old cow No. 28 heads the list with a total production of 176.2 pounds of fat, while the registered pure-bred animals 6 and 9 years old, cows Nos. 3 and 8, are down in the 137 and 142-pound class. Again, the 6-year-old cow No. 14, producing 231 pounds of fat in 9 months, is only 5½ pounds behind the record of 236.6 pounds of fat from the 9-year-old cow No. 9 in 10 months.

Attention must be drawn to the good record in herd 18 of the 5-year-old cow No. 4, producing 286.5 pounds of fat in 9 months, beating the best 10 months' record, 261.1 pounds, from cow No. 37 in the same herd, by 21.4 pounds of fat.

In herd 8, cow No. 14 gives 263.7 pounds of fat in 10 months. Two prominent individual records for 7 months are in herd 20, where cow No. 5 produces 220.3 pounds of fat; and in herd 27, where cow No. 19 produces 247.9 pounds of fat.

Glancing over the records of all the cows in this testing association, probably the most striking is that of cow No. 12 in herd 13, yielding 283.2 pounds of fat in 8 months. In this district there was a good hay crop and plenty of corn is fed.

TABLE XXI TOTAL PRODUCTION OF INDIVIDUAL COWS, ST. ARMAND, QUE.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
1	1	Grade.....	8	June 8, 1905..	6	3,242	137.3
	33	Hereford.....	8	" 14, 1906..	7	3,129	119.2
	32	Jersey.....	6	" 1, 1906..	7	3,020	123.5
	7	".....	9	Nov. 2, 1905..	7	3,097	155.8
	30	".....	5	April 29, 1906..	7	4,140	178.7
	27	".....	3	" 19, 1906..	8	2,710	128.7
	12	Registered Jersey.....	3	Jan. 7, 1906..	8	2,620	136.5
	3	".....	9	Aug. 11, 1905..	8	2,555	137.5
	8	".....	6	Nov. 3, 1905..	8	3,155	142.4
	6	".....	3	Aug. 11, 1905..	8	3,475	148.8
	25	Jersey.....	11	April 8, 1906..	8	3,455	151.9
	31	".....	11	May 10, 1906..	8	4,229	160.7
	13	Registered Jersey.....	6	Dec. 17, 1905..	8	3,895	170.7
	29	Jersey.....	7	April 16, 1906..	8	3,760	171.1
	28	".....	3	" 16, 1906..	8	3,365	176.2
	21	".....	2	Mar. 21, 1906..	9	2,500	115.0
	10	Registered Jersey.....	3	Nov. 11, 1905..	9	2,450	135.1
	5	".....	3	Aug. 1, 1905..	9	2,740	142.0
	19	Grade.....	7	Mar. 17, 1906..	9	3,930	158.4
	23	Jersey.....	7	" 29, 1906..	9	4,165	190.7
	24	".....	9	April 5, 1906..	9	4,465	191.2
	11	Registered Jersey.....	9	Nov. 15, 1905..	9	3,670	195.1
	15	".....	5	Mar. 2, 1906..	9	4,900	221.2
	14	".....	6	Jan. 25, 1906..	9	4,620	231.1
	2	".....	10	June 8, 1905..	10	2,850	138.4
	17	Grade.....	4	Mar. 2, 1906..	10	3,660	156.1
	18	Jersey.....	7	" 7, 1906..	10	4,065	209.3
	16	Registered Jersey.....	7	" 1, 1906..	10	4,452	211.2
	9	".....	9	Dec. 15, 1905..	10	4,470	236.6
2	6	Grade Durham.....	4	June 12, 1906..	7	3,357	128.1
	3	Grade Ayrshire.....	15	" 7, 1906..	7	3,791	131.7
	2	".....	5	May 23, 1906..	7	3,875	152.0
	5	".....	5	" 23, 1906..	7	4,320	156.0
	10	".....	2	April 27, 1906..	8	1,949	81.7
	7	".....	7	" 1905..	8	1,960	104.4

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TABLE XXI.—TOTAL PRODUCTION OF INDIVIDUAL COWS, ST. ARMAND, QUE.
—Continued.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
2	9	Grade Durham	3	May 20, 1906..	3	3,054	129.9
	4	"	8	April 23, 1906..	3	5,225	203.2
	8	"	6	" 19, 1906..	9	4,485	191.6
5	1	Low Grade	3	June 11, 1906..	5	1,555	77.9
	12	"	10	" 10, 1906..	5	2,225	82.9
	14	"	4	May 16, 1906..	6	2,335	95.7
	18	Low Grade	6	" 23, 1906..	6	2,435	104.4
	16	"	13	" 24, 1906..	6	3,050	117.0
	5	"	12	" 1, 1906..	7	3,854	154.1
	17	"	5	April 26, 1906..	7	3,450	142.3
	11	"	10	Mar. 26, 1906..	3	2,705	101.7
	13	"	10	April 2, 1906..	3	3,380	122.1
	15	"	4	Mar. 18, 1906..	3	3,030	130.2
	10	"	7	April 7, 1906..	3	3,242	144.4
	9	"	7	Mar. 30, 1906..	3	3,515	149.3
	6	"	12	" 21, 1906..	3	3,335	150.7
	7	"	5	" 28, 1906..	3	4,050	162.7
	2	"	8	" 30, 1906..	3	4,150	176.0
	3	"	8	" 26, 1906..	3	4,110	176.9
7	18	Grade	6	April 14, 1906..	7	2,860	101.6
	20	"	2	Feb. 23, 1906..	7	2,430	102.3
	6	"	10	April 26, 1906..	7	2,926	121.1
	12	"	10	May 15, 1906..	7	3,900	139.1
	19	Grade	2	Feb. 28, 1906..	3	2,670	107.9
	10	"	5	March 24, 1906..	3	3,500	132.1
	11	"	4	" 15, 1906..	3	3,240	135.3
	17	"	5	Feb. 18, 1906..	3	3,620	141.0
	9	"	8	March 30, 1906..	3	4,090	141.5
	16	"	7	" 15, 1906..	3	3,830	154.8
	2	"	5	April 20, 1906..	3	3,995	157.5
	13	Ayrshire	12	" 2, 1906..	3	4,180	160.0
	8	Grade	10	" 14, 1906..	3	4,200	160.5
	3	"	9	March 23, 1906..	3	4,240	166.3
	7	"	8	" 28, 1906..	3	4,030	173.7
	15	"	8	" 30, 1906..	3	4,190	175.5
	4	"	9	" 27, 1906..	3	4,410	178.1
	1	"	6	" 23, 1906..	3	4,700	193.1
8	19	Grade Guernsey..	2	July 12, 1906..	6	1,691	72.1
	11	Grade	7	Feb. 10, 1906..	6	3,115	110.1
	23	"	9	Dec. 10, 1905..	6	2,620	111.4
	3	"	6	March, 1905..	7	3,380	126.9
	9	"	10	June 2, 1906..	7	4,520	159.1
	2	Grade Guernsey..	6	Jan., 1906..	7	3,380	182.0
	21	"	2	April 24, 1906..	8	2,765	112.4
	22	Grade	13	Jan. 20, 1906..	8	3,900	149.5
	4	"	5	" 10, 1906..	8	4,025	152.0
	16	"	8	" 10, 1906..	8	3,930	161.1
	18	Grade Guernsey..	6	" 18, 1906..	8	4,095	177.6
	27	"	3	May 14, 1906..	8	3,605	201.5
	5	Grade	8	April 1, 1906..	8	4,610	228.2
	6	Grade Guernsey..	2	" 15, 1906..	9	2,670	116.9
	20	Grade Guernsey..	2	Jan. 30, 1906..	9	2,770	118.3
	7	Grade Guernsey..	3	March 27, 1906..	9	2,955	135.5
	15	Grade	4	Jan. 6, 1906..	9	3,586	156.4
	10	Grade Ayrshire..	3	April 8, 1906..	9	4,403	157.5
	24	Grade Guernsey..	3	Dec. 20, 1906..	9	3,550	162.4
	1	"	6	April 8, 1906..	9	3,910	179.0
	12	Grade	8	Jan. 25, 1906..	9	4,415	179.2
	26	Grade Guernsey..	3	April 17, 1906..	9	4,045	200.8
	25	"	3	Jan. 23, 1906..	9	4,055	204.8

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TABLE XXI.—TOTAL PRODUCTION OF INDIVIDUAL COWS, ST. ARMAND, QUE.
—Continued.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
8	13	Grade Guernsey.....	7	Feb. 8, 1906..	9	5,020	209·1
	8	".....	5	Jan. 5, 1906..	10	4,340	167·8
	14	".....	7	Feb. 22, 1903..	10	5,855	263·7
10	36	.....	.....	.....	4	1,550	54·6
	16	Ayrshire.....	4	July 3, 1905..	4	1,615	59·7
	32	.....	2	April 26, 1906..	4	1,783	68·5
	35	.....	.....	.....	4	2,206	73·0
	34	.....	.....	.....	4	2,880	110·7
	33	.....	2	May 15, 1906..	6	1,943	77·7
	20	Grade Ayrshire.....	2	Feb. 12, 1906..	6	2,010	85·8
	15	Grade.....	5	August 1, 1905..	6	2,498	92·1
	17	Ayrshire.....	3	July 20, 1905..	6	2,045	92·1
	27	.....	6	March 28, 1906..	6	3,168	122·6
	6	Grade Jersey.....	9	Dec. 12, 1905..	7	2,722	112·4
	19	Ayrshire.....	3	Aug. 17, 1905..	7	2,772	114·0
	10	Grade Holstein.....	8	June 20, 1905..	7	3,055	125·6
	23	Ayrshire.....	7	March 16, 1906..	7	4,545	169·9
	11	Gr. Holstein.....	7	June 4, 1905..	8	3,388	126·5
	5	Gr. Jersey.....	10	July 20, 1905..	8	3,492	145·8
	30	.....	13	May 10, 1906..	8	4,704	176·4
	1	Gr. Jersey.....	13	Feb. 16, 1906..	8	4,683	176·8
	28	.....	4	April 7, 1906..	8	4,509	183·3
	8	Gr. Ayrshire.....	8	March 2, 1906..	8	5,669	202·5
	31	.....	9	May 10, 1906..	8	4,835	207·3
	14	Gr. Ayrshire.....	6	Feb. 18, 1906..	8	5,510	211·5
	2	Gr. Jersey....	12	" 14, 1906..	8	5,156	227·3
	9	Gr. Ayrshire.....	8	March 16, 1905..	8	4,702	165·5
	18	Ayrshire.....	3	June 1, 1905..	9	2,814	110·7
	25	.....	7	March 22, 1906..	9	3,910	153·4
	7	Gr. Jersey....	9	Feb. 10, 1906..	9	3,986	162·7
	26	.....	12	March 28, 1906..	9	4,332	163·9
	3	Gr. Ayrshire.....	11	Jan. 20, 1906..	9	4,942	191·4
	24	.....	10	March 12, 1906..	9	5,438	218·5
	22	Ayrshire.....	4	" 4, 1906..	10	4,695	160·8
	4	Gr. Ayrshire.....	10	Jan. 10, 1906..	10	4,517	191·4
	13	Gr. Holstein.....	6	" 10, 1906..	10	4,570	193·0
	12	".....	6	Feb. 18, 1906..	10	5,693	230·7
11	23	Grade.....	10	July 26, 1906..	4	2,191	105·8
	25	".....	2	June 25, 1906..	5	2,092	82·2
	21	".....	2	" 18, 1906..	5	2,085	91·7
	22	".....	3	" 20, 1906..	5	2,450	103·8
	24	".....	3	" 26, 1906..	5	2,164	107·5
	23	".....	3	" 25, 1906..	5	3,126	140·7
	20	".....	10	Spring, 1905..	6	2,805	124·0
	17	".....	12	April 28, 1906..	7	3,006	126·2
	15	".....	4	" 26, 1906..	7	3,267	139·8
	16	".....	6	" 26, 1906..	7	3,763	161·0
	19	".....	5	May 1, 1906..	7	4,006	177·2
	18	".....	10	" 4, 1906..	7	4,260	196·9
	2	".....	6	March 25, 1906..	8	4,375	183·9
	13	".....	3	" 7, 1906..	9	3,957	142·8
	4	".....	5	April, 1906..	9	3,935	143·0
	10	".....	.....	March 19, 1906..	9	3,964	145·9
	8	".....	4	April 18, 1906..	9	3,121	148·0
	11	".....	10	Summer, 1905..	9	3,840	150·1
	9	".....	4	April 16, 1906..	9	3,286	153·3
	12	".....	3	March 5, 1906..	9	3,815	157·7
	1	".....	.....	Jan. 2, 1906..	9	4,015	163·4
	3	".....	3	April 13, 1906..	9	3,970	164·9
	7	".....	4	" 16, 1906..	9	3,580	166·5
	6	".....	March 30, 1906..	9	4,220	175·2

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TABLE XXI.—TOTAL PRODUCTION OF INDIVIDUAL COWS, ST. ARMAND, QUE.
—Continued.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
11	14	Grade.....	.....	March 9, 1906..	9	4,455	181.1
	5	".....	4	" 30, 1906..	9	4,165	185.2
13	24	Gr. Ayrshire.....	5	May, 1905..	4	1,425	54.3
	21	Gr. Jersey.....	2	" 1906..	4	1,450	73.4
	10	Gr. Ayrshire.....	9	Sept. 1, 1905..	5	2,405	87.1
	6	Grade.....	6	Jan. 1, 1906..	6	2,430	85.9
	20	Gr. Ayrshire.....	7	May, 1905..	6	2,785	92.9
	15	".....	2	June, 1906..	6	3,070	125.9
	5	Gr. Jersey.....	3	May, 1906..	6	3,145	135.7
	22	Gr. Ayrshire.....	5	" 1906..	6	4,175	179.9
	16	Durham.....	7	" 1906..	6	4,435	190.1
	4	Gr. Jersey.....	3	" 1905..	7	2,550	112.9
	18	Gr. Ayrshire.....	10	April 15, 1906..	7	2,920	120.7
	7	Gr. Guernsey.....	8	March 1, 1906..	7	4,015	157.1
	2	Gr. Ayrshire.....	4	May, 1906..	7	4,270	160.4
	20	".....	6	" 1906..	7	4,585	177.8
	13	Grade Ayrshire.....	2	April 15, 1906..	8	2,582	102.6
	3	".....	3	March 4, 1906..	8	4,095	140.3
	19	Grade Holstein.....	4	April 16, 1906..	8	4,267	160.1
	23	Grade Ayrshire.....	3	" 6, 1906..	8	4,677	163.6
	1	".....	9	March 1, 1906..	8	5,275	166.2
	8	".....	4	" 4, 1906..	8	4,465	170.4
	17	Grade Durham.....	11	" 7, 1906..	8	4,640	179.9
	9	Grade.....	8	April 15, 1906..	8	4,520	194.7
	14	Grade Ayrshire.....	5	March 15, 1906..	8	5,380	199.6
	11	Grade Jersey.....	5	" 28, 1906..	8	3,760	200.4
	12	Grade Durham.....	10	April 5, 1906..	8	6,425	283.2
15	6	Grade.....	3	Sept. 1905..	4	1,290	58.3
	31	".....	3	June 1906..	4	1,625	69.7
	9	Ayrshire.....	4	Nov. 5, 1905..	4	1,625	70.7
	3	".....	4	Aug. 1905..	4	1,735	76.6
	30	".....	4	".....	4	1,825	79.3
	28	Grade Ayrshire.....	2	Aug. 1906..	4	2,815	102.7
	23	".....	4	May 1906..	4	2,650	106.4
	29	Ayrshire.....	6	Aug. 1906..	4	3,775	159.7
	27	".....	2	" 4, 1906..	5	2,285	90.4
	26	".....	2	July 1906..	5	2,335	98.8
	22	Grade Ayrshire.....	2	May 1906..	5	2,525	102.8
	5	Ayrshire Jersey.....	3	Sept. 1905..	6	2,375	106.2
	13	Ayrshire.....	7	Jan. 1906..	6	3,415	134.7
	15	Grade Jersey.....	7	Feb. 1906..	6	3,650	136.6
	19	Grade Ayrshire.....	8	March 1906..	6	3,890	156.0
	16	Grade Jersey.....	4	Feb. 1906..	6	3,900	158.2
	8	".....	2	Nov. 1905..	7	2,010	134.8
	2	Ayrshire Jersey.....	3	Aug. 1905..	7	3,730	160.8
	1	Grade Ayrshire.....	4	Nov. 1905..	7	4,295	160.9
	10	Grade.....	2	April 1906..	7	3,265	164.9
	11	Grade Ayrshire.....	3	June 1905..	7	3,265	164.9
	21	Ayrshire.....	6	" 1906..	8	4,413	179.2
	4	Grade.....	8	April 1906..	8	5,610	193.0
	7	Grade Ayrshire.....	8	Sept. 1905..	8	4,725	193.2
	20	".....	4	Oct. 1905..	8	4,905	193.4
	14	".....	7	April 1906..	8	5,680	211.3
	18	Grade.....	12	Feb. 1906..	9	5,380	205.1
	18	Ayrshire.....	10	March 1906..	9	5,620	227.2
	12	".....	8	Calved Apr., '05 Aborted Dec. '05	10	4,890	223.0
	17	Ayrshire Jersey.....	10	March 1906..	10	5,630	240.7
17	3	Grade Ayrshire.....	4	June 23, 1906..	4	2,620	93.9
	4	Grade Jersey.....	9	March 7, 1906..	7	2,727	115.2

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TABLE XXI.—TOTAL PRODUCTION OF INDIVIDUAL COWS, ST. ARMAND, QUE.
—Continued.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
17	1	Grade Ayrshire	5	April 13, 1906..	7	3,540	140.9
	7	Grade Jersey	13	March 5, 1906..	8	3,105	107.1
	6	Grade Guernsey	6	" 13, 1906..	8	3,292	127.3
	10	"	3	" 11, 1906..	8	2,545	130.8
	8	Grade Jersey	13	" 6, 1906..	8	3,312	131.3
	5	"	5	Feb. 27, 1906..	8	3,660	140.8
	9	Grade Guernsey	3	March 8, 1906..	8	3,519	150.2
	2	Grade Ayrshire	12	" 2, 1906..	8	5,120	201.7
18	47	Grade Ayrshire	2	May 4, 1906..	6	1,640	82.0
	26	Grade Guernsey	7	June 27, 1906..	6	3,820	161.2
	14	Grade Ayrshire	2	" 8, 1906..	7	2,270	88.1
	45	Grade Guernsey	2	" 2, 1906..	7	2,762	107.5
	35	Grade Jersey	3	" 16, 1906..	7	3,355	128.2
	31	Grade Guernsey	3	" 9, 1906..	7	2,890	140.6
	6	"	11	" .., 1905 } Aug. .., 1906 }	7	3,696	146.9
	14	Grade Guernsey	12	June .., 1905 } July 23, 1906 }	7	4,030	166.9
18	1	Grade Guernsey	12	May 21, 1906..	7	4,183	172.5
	46	"	2	March 7, 1906..	8	2,450	113.3
	12	"	2	Feb 18, 1906..	8	2,740	123.6
	8	"	3	April 10, 1906..	8	3,770	164.5
	18	"	5	May 17, 1906..	8	3,894	187.8
	12	Grade Jersey	7	" 9, 1906..	8	4,790	193.4
	24	Grade Guernsey	9	April 5, 1906..	8	5,230	207.1
	19	"	7	" 28, 1906..	8	4,954	231.5
	41	"	2	March 11, 1906..	9	3,190	140.2
	43	"	2	" 25, 1906..	9	2,720	140.9
	20	"	3	April 10, 1906..	9	3,963	182.8
	22	Grade Jersey	7	March 15, 1906..	9	4,701	185.9
	39	Grade Guernsey	3	" 20, 1906..	9	4,690	193.3
	40	"	3	April 10, 1906..	9	3,995	196.3
	52	"	4	March 26, 1906..	9	4,160	203.0
	16	"	4	" 12, 1906..	9	4,550	208.7
	9	"	5	Feb. 9, 1906..	9	5,220	220.6
	27	"	7	March 29, 1906..	9	4,870	227.0
	29	Grade	11	Feb. 18, 1906..	9	5,650	235.7
	10	Grade Ayrshire	5	April 7, 1906..	9	6,708	236.1
	23	Grade Guernsey	9	" 16, 1906..	9	5,555	243.9
	25	"	7	March 27, 1906..	9	6,880	250.9
	30	Grade	9	Feb. 21, 1906..	9	7,080	252.8
	15	Grade Guernsey	12	March 27, 1906..	9	5,750	254.9
	33	"	6	" 22, 1906..	9	5,730	255.5
	4	"	5	Feb. 5, 1906..	9	5,700	286.5
	7	"	4	March 13, 1906..	10	4,340	202.5
	28	"	3	Feb. 13, 1906..	10	4,860	225.5
	5	"	5	March 16, 1906..	10	4,862	233.0
	13	"	11	Feb. 13, 1906..	10	5,580	241.7
	2	"	12	" 18, 1906..	10	5,830	251.7
	21	"	5	March 17, 1906..	10	5,625	254.7
	11	Grade Holstein	5	" 8, 1906..	10	6,962	257.4
	37	Grade Guernsey	6	Feb. 10, 1906..	10	5,790	261.1
20	11	Grade	2	Aug. 4, 1906..	5	1,830	76.9
	3	"	8	Farrow	6	1,160	42.2
	4	"	13	May 27, 1906..	6	3,618	160.9
	6	Grade Guernsey	8	June 27, 1906..	6	4,040	184.1
	7	Grade	4	Farrow	7	2,700	136.5
	10	"	3	June 3, 1906..	7	4,390	182.3
	5	Grade Jersey	4	May 10, 1906..	7	5,330	220.3

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TABLE XXI.—TOTAL PRODUCTION OF INDIVIDUAL COWS, ST. ARMAND, QUE.
—Continued.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
20	9	Grade	6	May 1, 1906..	8	5,010	190.2
	8	Grade Jersey.....	4	" 3, 1906..	8	4,680	195.8
	2	Grade Durham.....	8	" 10, 1906..	8	5,260	197.0
	1	"	7	March 15, 1906..	8	4,190	202.2
22	2	Registered Ayrshire..	6	" 1905..	5	1,420	58.3
	6	"	6	July 15, 1905..	5	1,555	60.1
	13	Grade	6	May 1905..	5	1,815	67.9
	1	Grade Ayrshire.....	4	" 1905..	5	1,575	70.0
	3	Grade	11	April 25, 1906..	5	2,830	89.2
	12	"	6	" 20, 1906..	5	2,290	91.6
	9	"	12	March 30, 1906..	5	2,945	104.9
	7	Grade Ayrshire.....	10	April 1, 1906..	5	2,775	106.0
	8	"	8	" 2, 1906..	5	2,990	109.9
	5	Grade	10	" 27, 1906..	5	3,195	110.0
	10	Grade Guernsey	8	" 15, 1906..	5	2,520	115.3
	11	Grade	9	" 26, 1906..	5	3,190	124.7
	4	"	12	" 24, 1906..	5	3,555	125.4
25	19	Grade Ayrshire	16	March 23, 1906..	5	2,495	98.4
	19	"	16	Feb. 4, 1906..	7	3,565	121.5
	11	"	12	Dec. 23, 1905..	7	2,985	122.9
	21	"	6	June 5, 1906..	7	3,964	155.9
	17	"	4	" 11, 1905..	8	3,415	140.1
	14	"	6	Jan. 8, 1906..	8	3,600	160.4
	22	"	7	May 9, 1906..	8	4,100	176.1
	3	"	4	Jan. 20, 1906..	9	3,170	127.9
	1	"	7	Feb. 25, 1905..	9	3,620	151.4
	16	"	4	Aug. 2, 1906..	9	3,615	152.9
	20	"	4	Feb. 2, 1906..	9	3,615	152.9
	20	"	6	April 7, 1906..	9	4,570	178.4
	4	"	7	July 21, 1905..	9	3,325	162.1
	13	"	4	Jan. 1, 1906..	9	4,020	180.7
	7	"	5	Feb. 1, 1906..	9	4,835	192.2
	18	"	4	" 7, 1906..	10	3,985	163.8
	12	"	3	Dec. 24, 1905..	10	4,630	172.9
	8	"	4	Jan. 24, 1906..	10	3,910	175.7
	15	"	6	Feb. 25, 1906..	10	4,595	179.7
	5	"	7	Jan. 3, 1906..	10	4,945	188.1
	9	Grade Jersey	10	Feb. 18, 1906..	10	5,210	212.0
	6	Grade Ayrshire	7	" 10, 1906..	10	5,305	218.8
	2	"	7	" 13, 1906..	10	5,390	227.0
27	12	"	5	April 4, 1906..	6	2,830	97.9
	15	"	6	" 15, 1906..	6	2,940	101.2
	18	Jersey.....	2	May 20, 1906..	7	1,708	90.1
	24	Grade	3	June 17, 1906..	7	3,338	104.9
	21	"	10	" 16, 1906..	7	4,401	170.3
	22	"	6	" 15, 1906..	7	4,832	210.2
	19	"	5	May 23, 1906..	7	5,050	247.9
	23	"	3	April 21, 1906..	8	3,224	137.9
	6	"	7	March 28, 1906..	8	4,330	146.3
	7	"	6	" 28, 1906..	8	3,800	158.9
	17	Grade	9	May 1, 1906..	8	4,251	162.7
	2	"	5	March 4, 1906..	8	4,040	171.9
	4	"	5	" 20, 1906..	8	4,920	196.0
	3	"	5	" 15, 1906..	8	4,330	196.9
	1	Grade	3	Feb. 20, 1906..	9	3,670	172.7
	25	"	9	April 14, 1906..	9	4,790	175.4
	9	"	13	March 15, 1905..	9	3,870	176.3
	8	"	8	" 1906..	9	4,260	188.7
	13	"	9	April 7, 1906..	9	4,432	190.5
	16	"	4	" 15, 1906..	9	4,220	198.8

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TABLE XXI.—TOTAL PRODUCTION OF INDIVIDUAL COWS, ST. ARMAND, QUE.
—*Concluded.*

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months tested.	Milk.	Fat.
						Lbs.	Lbs.
27	11	Guernsey	6	April 4, 1906..	9	5,210	208·4
	20	"	6	May 23, 1906..	9	5,015	210·4
	10	"	4	April 2, 1906..	9	4,346	215·0
	14	"	9	" 8, 1906..	9	5,188	215·5
	5	"	10	March 25, 1906..	9	6,810	274·5

TABLE XXII.—AVERAGE YIELDS OF 30 DAY PERIODS, 1906, ST. EDWIDGE, QUE.

30 days ending.	Total number of Cows.	AVERAGE.		
		Pounds of Milk.	Test.	Pounds of Fat.
April 10	46	555	3·8	20·9
May 10	161	543	3·5	19·3
June 10	288	651	3·8	24·9
July 9	307	725	3·7	27·2
Aug. 8	304	654	3·9	25·7
Sept. 7	295	589	4·0	23·8
Oct. 7	257	510	4·4	22·6
Nov. 6	236	354	4·7	16·9
Dec. 6	158	247	4·9	12·1

St. Edwidge, Que.

On comparing some records of individual cows, contrasts are brought to light which are worth more than a passing glance; they call for serious reflection. For instance, in herd 12 the highest yield of milk by any one cow is 4,414 pounds, containing 167·7 pounds of fat, but the 5-year old cow No. 4 yields 65·3 pounds of fat less than that in the same seven months. In herd 11 the highest yield of fat in 7 months is 120·4 pounds, but in herd 6 during the same period, one cow gives 182·3 pounds, or 61·9 pounds more fat.

Taking the group of herds recorded for 8 months, it is found that in herd 23 the 3-year-old cow No. 6 gives 44·1 pounds of fat less than the best producer; but, again in 8 months, cow No. 14 in herd 8 falls as much as 99·5 pounds behind the highest yield. Herds 8, 17 and 21 have cows giving the very satisfactory yields of 242·6, 237·6 and 251·5 pounds of fat, a very great improvement on the record of the best cow in herd 18, only 154·8 pounds fat. Herd 21 has a cow giving 96·7 pounds of fat more than the best cow in herd 18 in eight months.

In the lot of 6 herds recorded for 9 months, herd 16 consists of cows with a very even run of total production. However, in herd 1 there is a greater contrast, for a 12-year-old cow there gives 153·3 pounds of fat less than the one with the splendid total of 285·9 pounds of fat to her credit. Herd 7, again, has the wide variation of 92·5 pounds of fat between the highest and lowest yields, while the best cow in the herd gives only 4,990 pounds of milk, or 2,550 pounds less than the best cow in herd 1, during the 9 months.

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In herd 18 the 5 cows tested 8 months, all calving April, 1906, and none under 4 years old, have a total production of only 16,818 pounds of milk; but in herd 8 just double the number of cows, namely 10, have to their credit the much more satisfactory total of 53,978 pounds of milk, or more than 3 times as much milk.

In herd 3 the 6 cows tested 8 months show a total yield of 24,240 pounds of milk; in herd 21 the 6 cows tested 8 months show 33,573 pounds, a better yield by 9,333 pounds, from the same number of animals.

So instances might be multiplied, drawing comparisons between the best and poorest cows in each herd under the same management, and between the best cows in the various herds in the same locality. Such great differences indicated in these figures point emphatically to the great room for, and urgent need of, following up these records by judicious selection and better feeding of the good cows, and the speedy elimination of those with low and unsatisfactory total production.

It should be noticed that the lowest yields of milk and fat are by no means all from young 2 and 3-year-old stock. In 19 out of the 28 herds under consideration here, the lowest yields are from cows aged 4 to 12 years.

TABLE XXIII. TOTAL PRODUCTION OF INDIVIDUAL COWS, ST. EDWIDGE, QUE.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
1	30	French Canadian.....	7	Feb. —, 1906..	4	1,290	60.5
	13	Grade Ayrshire.....	3	Aug. 18, 1906..	4	2,180	80.9
	22	Guernsey, Holstein.....	4	July 4, 1906..	5	1,920	108.6
	1	.....			6	1,690	72.9
	36	Shorthorn, Grade Jersey.....	12	June 26, 1905..	6	2,110	81.9
	4	.....			6	2,150	107.4
	24	Grade Holstein.....	8	June 23, 1905..	7	2,590	112.3
	10	Grade Shorthorn.....	3	" 21, 1905..	7	2,470	117.8
	8	Guernsey, Hereford.....	2	April 29, 1906..	7	2,610	126.5
	16	Ayrshire, Grade Hereford.....	3	June 29, 1905..	7	3,720	130.1
	35	Grade Guernsey.....	10	April 29, 1906..	7	5,340	275.3
	2	.....			8	2,370	121.5
	5	.....			8	3,120	142.7
	14	Ayrshire, Grade Shorthorn, Jersey.....	3	May 28, 1905..	8	3,910	143.8
	11	Grade.....	3	Jan. 14, 1906..	9	3,500	150.9
	37	.....	12	July 3, 1905..	9	3,270	132.6
	9	Grade Shorthorn.....	3	April 2, 1906..	9	4,042	158.4
	29	.....	9	Mar. 14, 1905..	9	3,720	172.5
	20	Grade Shorthorn.....	9	April 9, 1906..	9	4,038	172.7
	18	Red Polled.....	4	Mar. 31, 1906..	9	3,980	181.9
	21	Grade Shorthorn.....	4	" 11, 1906..	9	4,200	185.9
	15	Grade Ayrshire.....	3	" 5, 1906..	9	4,820	187.8
	12	Grade.....	8	Jan. 14, 1906..	9	4,400	195.6
	17	Grade Ayrshire.....	3	Mar. 17, 1906..	9	5,340	198.1
	33	Shorthorn.....	10	" 21, 1906..	9	4,974	205.0
	26	Grade Ayrshire.....	8	Feb. 11, 1906..	9	4,890	208.6
	25	Grade Holstein.....	7	Mar. 25, 1906..	9	5,592	224.0
	31	Grade Ayrshire.....	9	" 3, 1906..	9	5,770	229.1
	34	French Canadian.....	10	Feb. 19, 1906..	9	4,990	239.8
	23	Jersey, Grade Shorthorn.....	5	April 2, 1906..	9	5,174	241.9
	32	Grade Shorthorn.....	10	Mar. 12, 1906..	9	5,920	244.7
	38	Shorthorn, Grade Ayrshire.....	12	" 6, 1906..	9	7,540	285.9
2	6	Grade.....	2	Mar. 28, 1906..	5	1,980	77.4
	4	.....	9	April 15, 1906..	8	5,170	198.3
	1	Durham.....	10	Mar. 10, 1906..	9	5,300	207.8
	3	Ayrshire.....	5	Feb. 11, 1906..	9	6,220	236.8
	2	Grade.....	8	Mar. 16, 1906..	9	6,530	242.8

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TABLE XXIII.—TOTAL PRODUCTION OF INDIVIDUAL COWS, ST. EDWIDGE, QUE.
—Continued.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months tested.	Milk.	Fat.
						Lbs.	Lbs.
3	1	Durham.....	7	April 29, 1906..	7	3,546	133.2
	3	Polled Angus.	6	May 4, 1906..	7	3,846	143.2
	8	Durham.....	2	Mar. 13, 1906..	8	2,900	118.1
	1	".....	3	Feb. 11, 1906..	8	3,630	143.6
	2	".....	3	Mar. 2, 1906..	8	4,170	162.3
	7	".....	3	Feb. 9, 1906..	8	4,140	165.8
	5	".....	4	Mar. 20, 1906..	8	4,840	173.5
4	6	Ayrshire.....	12	" 17, 1906..	8	4,560	194.2
	11	Grade.....	8	June 12, 1906..	4	2,486	101.1
	4	".....	9	May 30, 1906..	6	3,770	150.3
	9	".....	4	April 9, 1906..	7	3,880	147.3
	3	".....	10	" 9, 1906..	7	3,840	148.4
	8	".....	8	" 16, 1906..	7	5,204	250.0
	15	".....	3	Mar. 16, 1906..	8	3,000	119.8
	13	".....	6	" 24, 1906..	8	3,875	153.1
	10	".....	6	April 1, 1906..	8	3,620	153.4
	5	".....	9	Mar. 26, 1906..	8	4,785	174.1
	6	".....	7	" 17, 1906..	8	4,922	189.9
	1	(Durham) (Ayrshire)	6	" 15, 1906..	8	4,382	192.3
	2	(Canadian) (Durham)	9	" 24, 1906..	8	5,024	200.4
5	10	Durham and Ayrshire.....	2	May 11, 1906..	6	2,500	107.6
	6	Grade Durham.....	13	April 16, 1906..	8	4,664	184.7
	4	Ayrshire.....	3	Jan. 9, 1906..	9	3,585	140.6
	8	Durham and Ayrshire.....	4	Mar. 4, 1906..	9	3,860	154.0
	3	Durham.....	3	Dec. 21, 1905..	9	4,060	165.4
	2	" Grade Ayrshire.....	3	" 19, 1905..	9	3,915	175.6
	7	Grade Durham.....	7	Mar. 14, 1906..	9	6,561	233.6
	5	Durham, Ayrshire.....	10	" 16, 1906..	9	7,014	233.8
	1	".....	4	" 15, 1906..	9	6,514	243.2
6	3	Grade.....	6	May 30, 1906..	6	3,230	128.8
	9	".....	4	April 12, 1906..	7	3,576	138.6
	2	".....	6	" 17, 1906..	7	3,824	138.7
	5	".....	4	" 17, 1906..	7	3,540	140.7
	8	".....	6	May 1, 1906..	7	3,440	150.5
	4	".....	8	" 2, 1906..	7	4,500	173.0
	10	Ayrshire.....	7	April 20, 1906..	7	4,190	182.3
	6	Grade.....	3	March 8, 1906..	8	3,050	133.0
	7	".....	4	" 12, 1906..	8	3,860	161.9
7	10	.....	6	May 7, 1906..	7	3,270	109.5
	9	.....	4	April 22, 1906..	7	3,508	152.2
	8	.....	3	" 16, 1906..	8	3,446	143.6
	3	Grade.....	5	March 13, 1906..	8	4,340	159.8
	11	".....	4	" 25, 1906..	9	3,094	110.5
	7	".....	3	April 1, 1906..	9	3,490	142.8
	4	".....	4	March 24, 1906..	9	3,788	162.5
	5	".....	7	" 31, 1906..	9	4,130	168.6
	2	".....	4	" 18, 1906..	9	4,622	190.6
	6	".....	7	" 15, 1906..	9	4,448	194.3
	1	".....	5	Jan. 28, 1906..	9	4,200	201.5
	12	".....	10	March 9, 1906..	9	4,990	202.8
8	4	.....	.....	.....	6	3,315	132.4
	15	Grade Ayrshire.....	3	May 4, 1906..	7	2,789	129.0
	2	".....	4	April 25, 1906..	7	3,335	145.8
	11	Grade Jersey.....	12	May 7, 1906..	7	4,278	159.1
	7	Grade Hereford.....	11	April 20, 1906..	7	5,235	188.5
	14	".....	4	March 30, 1906..	8	3,425	143.1

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TABLE XXIII.—TOTAL PRODUCTION OF INDIVIDUAL COWS, ST. EDWIDGE, QUE.
—Continued.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
8	3	Grade Ayrshire.....	7	March 7, 1906..	2	4,865	172.4
	2	Grade Durham.....	9	" 10, 1906..	2	5,535	177.2
	5	".....	7	" 17, 1906..	2	5,178	205.7
	8	Grade Jersey.....	12	" 15, 1906..	2	5,317	211.9
	12	Grade Ayrshire.....	10	" 21, 1906..	2	5,880	228.2
	13	Grade Hereford.....	9	Feb. 23, 1906..	2	5,245	231.6
	9	".....	8	April 3, 1906..	2	5,773	232.3
	6	Durham.....	6	March 10, 1906..	2	6,625	257.5
	10	".....	8	" 7, 1906..	2	6,135	242.6
9	5	.....	3	May 22, 1906..	5	1,884	80.1
	4	.....	4	" 25, 1906..	5	2,403	99.0
	8	.....	7	June 5, 1906..	5	3,276	119.5
	2	Durham.....	8	May 1, 1906..	6	3,405	118.8
	1	".....	7	April 1, 1906..	6	3,975	121.3
	6	Hereford.....	9	" 11, 1906..	6	3,720	155.0
	3	Canadian.....	6	" 15, 1906..	6	4,030	164.9
11	7	Ayrshire.....	10	" 25, 1906..	6	4,275	173.5
	10	.....		" 27, 1906..	5	1,830	91.4
	6	.....		June 4, 1906..	6	2,710	97.3
	9	.....		Dec. 27, 1905..	6	2,250	109.8
	7	Hereford.....		May 27, 1906..	6	3,160	121.3
	2	Holstein.....	7	March 26, 1906..	7	2,960	103.8
	1	1/2 Jersey.....	8	" 21, 1906..	7	2,760	110.2
	5	Holstein.....	10	May 7, 1906..	7	2,891	111.8
	4	Grade Durham.....	11	" 7, 1906..	7	3,357	120.4
	3	1/2 Holstein.....	10	April 2, 1906..	8	3,149	125.3
12	12	Holstein-Durham.....	2	May 30, 1906..	5	1,950	73.8
	3	Jersey-Durham....	6	Feb. 15, 1906..	5	2,380	91.4
	7	3/4 Durham.....	4	March 27, 1906..	5	2,758	93.6
	9	Durham.....	3	April 9, 1906..	5	2,930	113.6
	10	Holstein-Durham.....	2	" 20, 1906..	6	2,860	124.3
	11	Canadian.....	14	" 22, 1906..	6	3,520	136.7
	4	Holstein-Durham.....	5	Dec. 14, 1906..	7	2,560	102.4
	8	Quebec Jersey.....	5	April 5, 1906..	7	3,586	143.8
	2	Grade Holstein.....	3	Feb. 20, 1906..	7	3,660	151.4
	6	Durham-Ayrshire.....	6	March 21, 1906..	7	3,798	160.4
	1	Durham-Jersey.....	9	" 15, 1906..	7	4,320	164.9
13	5	Ayrshire.....	8	" 15, 1906..	7	4,414	167.7
	4	Ayrshire.....	9	April 17, 1906..	8	3,663	136.3
	1	Durham.....	4	May 1, 1905..	2	3,100	137.1
	3	.....	10	April 17, 1906..	2	4,415	170.4
	7	Canadian.....	8	" 22, 1906..	2	3,885	182.8
	6	Durham.....	6	" 18, 1906..	2	4,197	190.6
	2	".....	4	" 15, 1906..	2	5,320	195.0
14	4	Grade Durham.....	8	March 17, 1906..	6	3,236	126.8
	2	.....		May 7, 1906..	7	4,260	166.2
	8	.....		" 7, 1906..	7	5,310	200.0
	10	.....	4	April 17, 1906..	2	3,730	156.5
	11	.....	3	" 13, 1906..	2	4,691	176.7
	3	.....	8	" 17, 1906..	2	4,785	196.2
	1	Grade Durham.....	6	March 27, 1906..	9	4,020	142.8
	6	".....	9	Feb. 23, 1906..	9	4,170	153.7
	9	".....	3	March 4, 1906..	9	4,510	176.0
	12	3	Feb. 16, 1906..	9	4,270	179.5
	7	Grade Durham.....	6	March 19, 1906..	9	5,310	208.3
	5	".....	6	" 25, 1906..	9	5,620	227.5

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TABLE XXIII.—TOTAL PRODUCTION OF INDIVIDUAL COWS, ST. EDWIDGE, QUE.
—Continued.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
15	7	Durham.....	13	June 25, 1906..	5	2,620	103·5
	9	Registered Shorthorn.....	12	March 26, 1906..	6	4,140	152·9
	11	"	5	June 13, 1906..	6	4,126	163·5
	2	Durham-Hereford ...	6	May 25, 1906..	7	5,165	214·4
	10	Registered Shorthorn.....	5	March 25, 1906..	8	4,330	157·3
	3	Durham-Hereford	6	" 11, 1906..	8	4,750	171·5
	4	Durham.....	10	" 2, 1906..	8	4,750	186·9
	6	"	5	" 22, 1906..	8	4,510	195·6
	1	Durham-Hereford	6	" 8, 1906..	8	5,130	206·5
	8	Durham.....	5	" 27, 1906..	8	5,760	215·7
16	4	Grade Durham.....	13	April 27, 1906..	7	5,444	203·3
	3	"	5	May 7, 1905..	8	2,455	93·8
	2	"	3	April 8, 1906..	8	4,614	172·7
	7	"	12	March 20, 1906..	8	4,805	183·6
	1	"	3	April 24, 1906..	8	5,574	228·5
	8	"	4	" 4, 1906..	9	4,967	200·7
	9	"	4	March 24, 1906..	9	5,045	202·1
	6	Durham-Hereford	9	" 31, 1906..	9	6,281	208·4
	5	Grade Durham	5	" 16, 1906..	9	5,760	226·0
17	11	Durham.	7	" 12, 1906..	7	3,950	159·1
	5	"	7	May 21, 1906..	7	5,070	188·7
	15	"	5	.....	7	4,730	190·6
	4	"	13	.....	7	5,000	200·0
	2	Durham-Hereford ..	4	.....	8	3,360	169·3
	13	"	3	March 13, 1906..	8	4,690	182·7
	7	"	9	.....	8	4,760	191·0
	1	"	4	March 22, 1906..	8	5,090	200·5
	10	" .....	.....	.....	8	5,570	203·4
	3	Durham.....	10	March 31, 1906..	8	5,570	214·4
	6	"	7	.....	8	5,790	237·6
	8	"	5	April 6, 1906..	9	5,050	184·0
	14	Durham-Hereford ..	3	" 3, 1906..	9	4,916	188·4
	16	Durham.	4	" 3, 1906..	9	5,282	206·0
18	6	Grade	8	May 20, 1906..	7	3,880	158·5
	1	"	4	April 21, 1906..	8	1,997	89·9
	7	"	7	" 2, 1906..	8	3,513	136·5
	3	"	9	" 20, 1906..	8	3,750	144·5
	8	"	7	" 16, 1906..	8	3,510	146·2
	5	"	9	" 21, 1906..	8	4,018	154·8
	4	"	8	" 6, 1906..	9	3,315	147·0
19	10	Canadian.....	10	June 23, 1906..	6	3,320	115·9
	9	"	8	May 17, 1906..	7	3,933	155·7
	8	"	8	" 11, 1906..	7	4,272	167·7
	5	Grade	5	April 23, 1906..	8	3,253	132·7
	6	"	4	" 25, 1906..	8	3,545	133·5
	7	Canadian	5	May 5, 1906..	8	3,490	159·3
	3	Grade.....	11	April 14, 1906..	8	4,130	165·5
	4	"	7	" 15, 1906..	8	4,460	168·7
	2	"	3	March 24, 1906..	9	3,276	129·2
	1	"	3	" 2, 1906..	9	4,120	147·3
20	12	Canadian	5	May 30, 1906..	6	3,050	119·3
	14	Ayrshire	3	June 13, 1906..	6	3,032	125·2
	15	Durham	4	" 15, 1906..	6	3,336	142·1
	11	"	6	May 25, 1906..	6	3,870	149·9
	13	Jersey	4	June 4, 1906..	6	3,360	150·7
	1	Durham ...	11	" 14, 1905..	7	3,120	115·8
	2	Grade Jersey	6	July 16, 1905..	7	2,445	119·3
	4	Hereford.....	5	May 22, 1905..	7	2,885	132·4

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TABLE XXIII.—TOTAL PRODUCTION OF INDIVIDUAL COWS, ST. EDWIDGE, QUE.
—Continued.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
20	10	Durham	13	April 28, 1906..	7	3,935	159.8
	9	Jersey	4	" 15, 1906..	7	3,980	215.6
	3	$\frac{1}{2}$ Durham	4	" 11, 1905..	8	2,435	127.7
	7	Canadian	4	" 4, 1906..	8	3,620	143.1
	5	Hereford	5	March 31, 1906..	8	4,540	161.5
	6	"	4	" 30, 1906..	8	3,615	166.3
	8	Durham, Hereford.	5	April 12, 1906..	8	4,310	169.7
21	6	Grade Durham	3	" 22, 1906..	7	4,110	161.8
	7	"	3	March 7, 1906..	7	5,020	186.3
	2	"	5	April 25, 1906..	7	4,750	195.2
	9	Durham, Hereford	4	May 9, 1906..	7	5,740	220.4
	3	Grade Durham	4	March 21, 1906..	8	4,410	183.0
	12	"	3	April 4, 1906..	8	5,230	207.0
	5	Grade	11	March 30, 1906..	8	5,640	227.6
	4	"	4	April 4, 1906..	8	5,700	232.9
	1	Grade Durham	5	" 6, 1906..	8	5,913	245.5
	10	$\frac{3}{8}$ Hereford	8	" 10, 1906..	8	6,680	251.5
	8	Grade Durham	5	March 1, 1906..	9	6,655	266.2
	11	Grade	8	Jan. 25, 1906..	9	7,145	278.1
22	2	"	6	April 23, 1906..	5	2,523	96.2
	5	"	4	" 2, 1906..	6	2,435	91.1
	4	"	5	" 5, 1906..	6	2,906	109.0
	1	"	6	March 24, 1906..	6	3,350	117.6
	3	"	6	" 16, 1906..	6	2,680	118.4
23	5	Grade Durham	13	May 15, 1906..	6	5,010	193.1
	2	"	10	" 3, 1906..	7	4,242	149.0
	6	Grade Ayrshire	3	Dec. 23, 1905..	8	3,600	149.2
	1	Canadian	12	March 14, 1906..	8	4,010	153.8
	4	Grade Durham	14	" 12, 1906..	8	4,245	158.3
	3	"	6	" 14, 1906..	8	5,316	193.3
24	5	"	5	May 20, 1906..	5	2,460	98.6
	2	"	5	May 20, 1906..	6	4,680	212.2
	7	"	3	April 3, 1906..	8	3,230	146.1
	6	"	3	March 31, 1906..	8	3,360	158.2
	1	"	5	Feb. 16, 1906..	8	3,780	175.0
	4	"	4	April 4, 1906..	8	4,225	178.1
	3	"	5	" 20, 1906..	8	5,060	206.6
26	1	Grade Durham	9	April 16, 1906..	4	2,486	90.9
	5	"	6	" 13, 1906..	4	2,663	116.3
	4	"	3	March 30, 1906..	5	2,180	80.1
	8	"	3	April 4, 1906..	5	2,212	80.7
	6	"	7	March 25, 1906..	5	2,050	95.5
	9	"	13	Feb. 18, 1906..	5	2,660	103.2
	3	"	8	March 27, 1906..	5	3,106	108.1
	2	"	7	" 26, 1906..	5	3,245	142.8
27	8	Durham	3	April 18, 1906..	8	3,271	129.8
	4	"	5	" 1, 1906..	8	4,365	157.4
	1	"	9	" 24, 1906..	8	3,862	165.9
	2	Ayrshire	5	" 10, 1906..	8	4,125	169.8
	7	Hereford	4	" 12, 1906..	8	4,160	174.9
	6	Durham	5	May 4, 1906..	8	4,640	181.7
	3	"	12	April 10, 1906..	8	5,075	183.9
	5	"	10	" 3, 1906..	8	3,990	184.5
29	2	"	4	Farrow	4	1,559	70.2
	14	"	3	April 8, 1906..	4	1,955	78.3
	13	"	6	" 12, 1906..	4	2,133	82.3

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TABLE XXIII.—TOTAL PRODUCTION OF INDIVIDUAL COWS, ST. EDWIDGE, QUE.
—Concluded.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
29	18		4	April 6, 1906..	4	2,043	82 8
	17		10	Farrow.....	4	1,793	84 2
	8		9	March 26, 1906..	4	2,192	88 7
	15		3	" 29, 1906..	4	1,905	90 2
	1		4	" 10, 1906..	4	1,835	93 5
	5		10	April 7, 1906..	4	2,650	95 0
	16		8	March 9, 1906..	4	2,209	95 6
	19		7	" 19, 1906..	4	2,555	98 2
	4		7	" 19, 1906..	4	2,640	102 1
	20		7	May 12, 1906..	4	2,626	102 3
	7		7	March 19, 1906..	4	2,520	105 7
	6		5	April 10, 1906..	4	2,808	108 4
	19		5	" 25, 1906..	4	2,557	119 6
	3		7	March 7, 1906..	4	2,862	119 9
	9		9	April 10, 1906..	4	3,082	121 3
31	9	Ayrshire ..	3	Jan. 18, 1906..	7	3,160	145 4
	6	" ..	5	" 5, 1906..	7	3,700	153 8
	10	" ..	10	April 4, 1906..	7	5,340	217 2
	3	Durham-Hereford ..	6	Jan. 10, 1906..	8	3,500	142 6
	5	Durham ..	6	April 6, 1906..	8	5,130	174 7
	4	" ..	3	" 17, 1906..	8	4,360	175 7
	8	" ..	3	March 28, 1906..	8	4,520	182 2
	2	Ayrshire ..	11	April 15, 1906..	8	4,720	183 9
	1	Canadian ..	4	" 25, 1906..	8	4,389	188 3
	7	" ..	7	" 20, 1906..	8	4,770	188 7

TABLE XXIV.—DIFFERENCE BETWEEN BEST AND POOREST COWS IN THE SAME HERD, AT ST. EDWIDGE, QUE., 1906.

Herd Number.	Number of Months.	DIFFERENCE IN YIELD.		Age of Cow with lowest yield.
		Milk.	Fat.	
		Lbs.	Lbs.	
1	9	4,270	151	12
7	9	1,900	92	4
14	9	1,600	84	6
17	8	2,430	68	4
18	8	2,000	68	5
8	8	1,760	65	7
13	8	1,650	59	9
15	8	1,430	58	5
31	8	1,270	40	6

Table XXIV is compiled to illustrate the difference between the best and poorest cows in several herds at St. Edwidge. In herd 1 the best cow gives in 9 months 151 pounds of fat more than the poorest cow in that herd, which animal is not a heifer by any means, but rejoicing in the mature wisdom of 12 years. In the column for the age of the cow with the lowest yield in the various herds, is to be found nothing under 4 years old

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A glance over the records points this moral, that in many cases neither heifers nor farrow cows can be blamed for pulling down average herd yields of milk and fat; it is too frequently the mature animal that is the offender and would continue undetected unless revealed by such work as these associations undertake.

TABLE XXV.—COMPARISON OF HERDS AT ST. EDWIDGE, QUE., 8 MONTHS—
MAY TO DECEMBER, 1906.

Herd Number.	Number of Cows.	TOTAL YIELD.		AVERAGE YIELD PER COW.	
		Milk.	Fat.	Milk.	Fat.
		Lbs.	Lbs.	Lbs.	Lbs.
21.....	8	45,713	1,836	5,714	229
8.....	10	53,980	2,084	5,398	208
18.....	5	16,525	680	3,305	136

AVERAGE RETURNS PER COW.

Herd 8 gave 72 lbs. fat at 22c. = \$15.84
" 21 " 93 " 22c. = \$20.46 } More than herd 18.

Three herds in the St. Edwidge, Que., association are contrasted in table XXV, indicating that the 8 cows in herd 21 have an average yield of 229 pounds of fat, but the 5 in herd 18 can only muster up enough feed or vitality to produce 136 pounds. Who can measure the possibilities of 'what might be'?

The average receipts are seen to be \$20.46 per cow more in herd 21 than in herd 18 during 8 months.

TABLE XXVI.—AVERAGE YIELDS OF 30 DAY PERIODS, 1906, ST. CAMILLE, QUE.

30 days ending.	Total number of Cows.	AVERAGE.		
		Milk.	Test.	Fat.
		Lbs.		Lbs.
May 3.....	23	513	3 5	18 3
June 2.....	151	582	3 5	20 9
July 2.....	182	688	3 8	26 2
Aug. 1.....	180	612	3 8	23 4
Aug. 31.....	160	498	4 0	20 3
Sept. 30.....	130	429	4 3	18 8
Oct. 20.....	120	350	4 6	16 2
Nov. 30.....	58	243	4 9	11 9
Dec. 29.....	40	243	4 6	11 4

St. Camille, Que.

In considering the records of the 21 herds comprising this association, it is a matter of great regret that the members did not continue recording weights of milk for a longer period. There are only 13 herds for which figures are given for 6 months or more.

However, the totals available are both interesting and instructive; they point to the advisability that exists in many herds of a continuation of the system of record-

ing weights, so that intelligent steps may be taken in discarding cows with unsatisfactory yields, thus improving the general average, and maintaining only such animals as will come up to a reasonable standard of production.

In herd 28 it is found that the highest yield of any cow is 2,900 pounds of milk, containing 115.5 pounds fat; but the best yield in herd 16 is 4,240 pounds of milk and 180.8 pounds of fat, or an increase of 1,340 pounds of milk and 65.3 pounds of fat. The difference in the one herd between the highest and lowest yield of fat is only 23.6 pounds, indicating a lot of cows of fairly even production; but in herd 16 the difference is 52.4 pounds of fat in 6 months, the low yield being not from a young heifer, but from a 5-year-old cow. In herds 20 and 9 that difference in fat production still runs high, being 48 and 56 pounds.

Taking herd 8 it will be observed that the best cow gave 950 pounds less milk in 7 months than the best cow in herd 16 in 6 months.

Looking at the record of herds 19 and 32, a startling contrast is revealed. The best cow in herd 19, calving in March, gave only 3,115 pounds of milk in 9 months (which is a lower yield than many cows in this association gave in 4 months), while a cow in herd 32 shines forth as the producer of 6,183 pounds of milk in 8 months. There are evidently some treasures here, valuable cows worth all possible care and attention; while with a first-class creamery in operation there is every inducement to the farmers of the district to keep better dairy stock.

The figures given in herd 12 show the wide range of individual production in a period of 8 months. Cow No. 12, 7 years old, calving in April, gives only 124.5 pounds of butter fat, but cow No. 1, also 7 years old, calving a fortnight later, has 210.6 pounds of fat to her credit, just 86 pounds more. Leaving out the heifer, this herd may be said to contain 5 good, 3 medium and 4 poor cows. Such classification will probably fit a large number of dairy herds. Would it not pay better in every sense to concentrate energy and work with better material? The Babcock test is a wonderfully useful search light.

TABLE XXVII.—TOTAL PRODUCTION OF INDIVIDUAL COWS, ST. CAMILLE, QUE.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
1	1	Grade	3	April 15, 1906..	4	2,035	99.1
	3	"	2	" 18, 1906..	4	2,480	118.7
	4	"	2	Mar. 16, 1906..	4	2,777	144.4
5	5	Canadian.	3	April 13, 1906..	4	1,635	59.8
	7	Durham	2	" 19, 1906..	4	1,850	73.9
	4	"	7	" 18, 1906 ..	4	2,125	74.8
	3	Canadian.....	8	" 8, 1903..	4	2,135	77.1
	6	Durham	7	" 28, 1906..	4	1,940	80.8
	2	Grade Ayrshire.	4	" 18, 1906..	4	2,215	89.9
	1	"	10	" —, 1906..	5	2,675	115.6
6	8	Hereford.	8	May 17, 1906..	6	2,257	87.7
	2	½ Jersey.....	4	April 21, 1906..	6	2,050	92.2
	5	Holstein	12	" 26, 1906..	6	2,400	96.5
	1	Hereford.	10	" 20, 1906..	6	2,638	106.7
	4	Holstein	6	" 14, 1906..	6	2,888	108.0
	7	Canadian	10	" 27, 1906..	6	2,645	108.9
	6	"	4	May 16, 1906..	6	2,742	115.7
	3	Grade	7	" 7, 1906..	6	2,996	119.9

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TABLE XXVII.—TOTAL PRODUCTION OF INDIVIDUAL COWS, ST. CAMILLE, QUE.,
—Continued.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
7	4 $\frac{1}{2}$	Durham.....	6	May 22, 1906..	4	1,850	76.5
	3	".....	4	April 30, 1906..	5	1,975	77.7
	2	".....	9	May 3, 1906..	5	2,620	110.8
	1	".....	5	Feb. 14, 1906..	6	3,535	150.4
8	9	Grade Durham.....		June —, 1906..	6	3,490	133.7
	3	".....	2	April 5, 1906..	7	2,395	92.1
	6	".....	5	Mar. 25, 1906..	7	3,400	118.9
	7	".....	6	April 15, 1906..	7	3,620	118.9
	4	".....	4	Mar. 10, 1906..	7	3,135	119.3
	2	".....	8	" 15, 1906..	7	3,140	122.9
	1	".....	6	" 23, 1906..	7	3,020	124.4
	8	".....	6	April 5, 1906..	7	3,470	137.5
9	5	".....	7	Mar. 12, 1906..	7	3,680	146.6
	5	Durham and Hereford.....	7	July 13, 1906..	4	2,230	151.5
	10	Grade Durham..	2	May 30, 1906..	5	1,965	76.0
	9	".....	2	" 3, 1906..	6	2,225	94.2
	14	Grade.....	2	" 4, 1906..	6	2,420	97.5
	2	Grade Durham....	16	April 8, 1906..	6	2,500	101.1
	8	Grade.....	8	" 26, 1906..	6	2,937	110.1
	4	Durham and Hereford.....	10	" 30, 1906..	6	3,213	119.2
	3	".....	7	" 16, 1906..	6	3,127	119.3
	11	Grade Durham.....	3	" 13, 1906..	6	3,015	121.6
	13	Grade.....	11	" 28, 1906..	6	2,795	127.5
	6	".....	9	" 18, 1906..	6	3,585	130.1
	12	Grade Durham.....	10	" 10, 1906..	6	3,080	138.4
	7	Grade.....	7	May 18, 1906..	6	3,295	141.6
	1	Grade Durham.....	9	" 11, 1906..	6	4,039	150.4
10	8	".....		April 15, 1906..	4	2,030	75.3
	6	".....		" 25, 1906..	4	2,490	85.7
	11	Grade.....		Feb. 15, 1906..	4	2,020	89.5
	5	Grade Durham.....		April 12, 1906..	4	2,330	101.2
	7	".....		" 26, 1906..	4	3,390	107.3
	4	".....		" 13, 1906..	4	3,200	120.1
	3	".....		" 12, 1906..	4	3,150	120.8
	9	".....		" 14, 1906..	4	3,470	128.2
	1	".....		" 18, 1906..	4	3,070	128.8
	2	".....		" 15, 1906..	4	3,370	132.8
	15	".....			7	2,180	111.5
	5	".....		June 20, 1906..	7	3,278	132.5
	12	Durham and Canadian.....	7	April 20, 1906..	8	3,270	124.5
	14	".....	2	May 24, 1906..	8	3,192	127.2
	13	Grade.....	8	April 24, 1906..	8	3,950	133.7
	9	".....	5	May 21, 1906..	8	3,506	136.7
	3	Grade Durham.....	6	Feb. 15, 1906..	8	3,300	138.6
	10	Durham and Canadian.....	8	April 24, 1906..	8	4,140	143.0
	11	Grade.....	12	May 14, 1906..	8	3,860	154.7
	7	".....	5	" 5, 1906..	8	3,710	158.1
	2	Grade Durham.....	12	April 27, 1906..	8	3,590	161.6
	6	Grade.....	7	" 27, 1906..	8	4,310	162.3
	4	".....	12	" 20, 1906..	8	4,280	167.0
	8	Ayrshire.....	7	May 3, 1906..	8	4,480	205.0
	1	Grade Durham.....	7	" 4, 1906..	8	4,800	210.6
13	4	Grade.....			5	2,100	88.8
	1	".....			5	2,505	95.6
	2	".....			5	2,565	104.3
	3	".....			5	2,855	105.2
	5	".....			5	2,940	114.6

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TABLE XXVII. TOTAL PRODUCTION OF INDIVIDUAL COWS ST. CAMILE, QUE.
—Continued.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
14	2	.....	.....	.....	4	1,595	72.8
	3	.....	.....	.....	4	1,690	80.9
	4	.....	.....	.....	4	2,065	93.0
	1	.....	.....	.....	4	2,190	101.4
16	5	Grade Durham	8	.....	5	3,060	116.5
	6	"	12	.....	5	4,260	156.6
	3	"	3	.....	6	3,650	128.4
	2	"	3	.....	6	4,040	151.0
	8	"	5	.....	6	4,280	155.1
	7	"	7	.....	6	4,630	169.4
	1	"	6	.....	6	4,550	176.5
	4	"	9	.....	6	4,240	180.8
17	3	.....	9	April 29, 1906..	8	3,380	133.7
	6	.....	4	" 21, 1906..	8	3,625	143.6
	5	.....	4	May 17, 1906..	8	3,616	144.6
	4	.....	3	" 18, 1906..	8	3,135	152.2
	1	.....	9	April 13, 1906..	8	3,800	167.8
	2	.....	9	" 17, 1906..	.....	4,895	207.1
18	4	.....	5	April 8, 1906..	5	1,770	78.9
	3	.....	8	" 15, 1906..	5	1,780	80.7
	1	.....	9	" 3, 1906..	5	2,010	87.5
	2	.....	8	" 10, 1906..	5	2,145	93.3
	5	.....	7	June 1, 1906..	5	2,410	103.2
	7	.....	5	March 15, 1906..	5	2,295	105.0
	6	.....	5	" 23, 1906..	5	2,320	110.8
19	9	.....	10	April 16, 1906..	8	2,650	94.5
	10	.....	13	" 29, 1906..	8	2,980	107.9
	11	.....	7	May 15, 1906..	8	2,962	112.2
	6	.....	9	March 24, 1906..	8	2,755	116.2
	8	.....	13	April 7, 1906..	8	2,920	126.9
	2	.....	7	March 18, 1906..	9	2,720	107.7
	5	.....	5	" 23, 1906..	9	2,785	110.3
	3	.....	3	" 20, 1906..	9	2,490	120.9
	1	Holstein	7	" 16, 1906..	9	3,150	127.5
	4	.....	6	" 23, 1906..	9	3,115	129.9
20	6	Grade	3	May 24, 1906..	5	2,305	85.0
	1	"	4	April 8, 1906..	6	2,335	91.0
	4	"	12	" 30, 1906..	6	2,720	95.7
	2	"	4	" 20, 1906..	6	2,740	107.8
	3	"	9	" 26, 1906..	6	2,975	119.5
	5	"	8	" 22, 1906..	6	3,292	139.1
22	10	Hereford	6	.....	4	2,065	73.2
	8	Grade Durham	11	.....	4	2,780	87.7
	5	"	9	.....	4	2,435	94.5
	6	"	10	.....	4	2,875	96.3
	3	"	7	.....	4	2,780	101.6
	2	"	6	.....	4	2,950	105.7
	1	"	19	.....	4	3,320	108.0
	4	"	9	.....	4	2,875	110.6
25	12	Grade Durham	4	April 28, 1906..	6	3,350	129.3
	7	Grade	.....	.....	7	3,930	117.9
	2	Grade Durham	10	March 1, 1906..	7	3,069	136.7
	5	Pure Durham	5	" 15, 1906..	7	3,410	144.4
	8	Grade	10	" 10, 1906..	7	3,905	146.0
	4	Grade Durham	5	" 1, 1906..	7	4,120	160.0
	6	Pure Durham	9	8	3,280	132.0

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TABLE XXVII.—TOTAL PRODUCTION OF INDIVIDUAL COWS, ST. CAMILLE, QUE.
—Concluded.

Herd Number.	Cow Number.	Breed.	Aged.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
25	1	Grade Durham.....	4	April 15, 1903..	8	3,390	149.2
	11	".....	4	May 1, 1906..	8	3,570	152.4
	9	Grade.....	6	April 30, 1906..	8	4,470	177.5
	3	Grade Durham.....	6	" 20, 1906..	8	4,290	181.6
	10	Grade.....	6	March 5, 1906..	8	4,140	182.8
27	6	Grade Durham.....		" 24, 1906..	5	2,937	111.8
	9	".....		" 28, 1906..	5	2,880	111.8
	8	".....		" 21, 1906..	6	3,155	116.2
	1	".....		" 19, 1906..	6	2,995	117.4
	2	".....		" 17, 1906..	6	3,630	122.1
	3	".....		" 20, 1906..	6	3,452	127.3
	4	".....		" 26, 1906..	6	3,853	132.4
	7	".....		" 19, 1906..	6	3,197	132.8
	5	".....		" 24, 1906..	6	3,619	136.2
28	1	.....	4	April 17, 1906..	6	2,670	91.9
	5	.....	15	" 10, 1906..	6	2,325	96.5
	2	.....	9	" 25, 1906..	6	2,275	98.3
	6	.....	4	" 17, 1906..	6	2,240	104.2
	4	.....	10	" 20, 1906..	6	2,855	113.6
	3	.....	14	" 17, 1906..	6	2,900	115.5
31	6	Grade.....	2	" 1, 1906..	5	1,540	61.9
	2	".....	3	" 25, 1906..	5	1,845	75.1
	1	".....	3	March 28, 1906..	5	2,505	97.5
	4	".....	6	May 5, 1906..	5	2,550	101.2
	5	".....	6	March 31, 1906..	5	2,845	113.8
	3	".....	9	April 20, 1906..	5	2,965	117.8
32	3	Pure Durham.....	7	Feb. 1, 1906..	4	2,320	89.6
	2	".....	6	April 3, 1906..	8	6,183	228.4
	1	".....	4	" 6, 1906..	9	6,023	244.3

TABLE XXVIII.—AVERAGE YIELD—FOUR ASSOCIATIONS—1906, SIX MONTHS, MAY TO OCTOBER.

Association.	Number of Cows.	AVERAGE YIELD.		PROPORTION OF COWS YIELDING.	
		lbs. Milk.	lbs. Fat.	150 lbs. Fat or over.	Less than 100 lbs. Fat (Average 90 lb.).
St. Camille.....	98	3,201	123	14 per cent.	18 per cent.
Lotbinière....	119	3,268	132	27 "	12 "
St. Edwidge.....	251	3,540	143	36 "	4 "
North Oxford..	209	4,828	163	66 "	1½ "

The aim of table XXVIII is to emphasize the difference in yield of butter fat in various localities. In St. Camille, Que., for instance, the members' records betoken the fact that only 14 per cent of the cows give 150 pounds of fat, or more, in 6 months; but at North Oxford, Ont., that percentage runs as high as 66. Conversely, at North Oxford only 1½ per cent of the cows give less than 100 pounds of fat, while at St. Camille 18 per cent are responsible for such a poor showing.

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TABLE XXIX.—AVERAGE YIELDS OF 30 DAY PERIODS, 1906, LOTBINIERE, QUE.

30 days ending	Total number of Cows.	AVERAGE.		
		Pounds of Milk.	Test.	Pounds of Fat.
June 16	145	615	3·8	23·5
July 16.	156	658	3·8	24·9
August 15.	150	545	3·8	20·9
September 14.	160	519	4·1	21·4
October 14.	150	513	4·3	22·2
November 13	126	369	4·4	16·2
December 13.	65	247	4·7	11·7

Lotbinière, Que.

The best individual record in this association is made by a cow in herd 8, which gave 5,220 pounds of milk in 6 months, beating any 7 months' performance of any cow. In the same herd is found the greatest difference between any two animals for 6 months in total yield of fat, a 9-year-old cow producing 64·8 pounds of fat less than the respectable yield of 208 pounds. This represents a difference of more than \$16 in 6 months in the value of the butter from the two cows.

In the group of herds with 7 months' records that difference in total fat production is still more accentuated, where in herd 19 a 3-year-old gives 96 pounds of fat less than the best cow in that herd, or over \$24 less return in 7 months. While in this association the low yields are mostly from young stock, two and three-year-olds, it should be remarked that there are also 6, 8, 9 and 12-year-olds in an undesirably conspicuous position. This indicates once more that recording and frequent testing are necessary to locate the animals with notoriously low production, otherwise they are bound to creep into herds and pull down the general average, while consuming feed that would yield a good cash income when fed judiciously to better stock.

TABLE XXX—TOTAL PRODUCTION OF INDIVIDUAL COWS, LOTBINIERE, QUE.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
1	6	Ayrshire	5	April 20, 1906..	5	2,950	113·9
	11	Grade.	3	March 2, 1906..	6	2,440	95·0
	5	"	7	April 25, 1906..	6	3,010	113·5
	3	"	3	Dec. 26, 1905..	6	2,860	122·1
	7	"	4	April 6, 1906..	6	3,560	130·9
	10	"	5	May 15, 1906..	6	3,850	142·2
	9	"	6	" 10, 1906..	6	3,900	142·7
	8	"	12	April 16, 1906 .	6	3,990	144·1
	2	"	5	May 5, 1906..	6	3,700	151·9
	1	"	12	June 9, 1906..	6	4,265	155·4
2	4	"	13	" 9, 1906..	6	4,577	155·4
	10	"	3	July 1, 1906..	6	2,644	163·3
	3	"	6	April 28, 1906..	6	2,920	105·7

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TABLE XXX—TOTAL PRODUCTION OF INDIVIDUAL COWS, LOTBINIERE, QUE.
Continued.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
2	14	Ayrshire	2	March 17, 1906..	7	2,305	104.7
	11	"	3	" 15, 1906..	7	2,729	107.2
	13	"	3	" 29, 1906..	7	2,560	111.6
	12	Ayrshire	3	" 13, 1906..	7	2,870	116.5
	9	Grade	4	" 14, 1906..	7	2,920	121.5
	8	"	4	May 14, 1906..	7	3,150	122.9
	5	"	5	March 18, 1906..	7	3,005	126.9
	4	Ayrshire	5	" 15, 1906..	7	3,315	131.0
	2	Grade	7	April 1, 1906..	7	3,065	132.8
	6	"	5	" 23, 1906..	7	3,650	141.5
	1	"	11	" 14, 1906..	7	4,025	144.5
3	7	"	5	May 17, 1906..	7	3,700	153.2
	2	.....	5	April 12, 1906..	4	1,365	56.2
	10	.....	4	June 6, 1906..	4	1,442	60.6
	8	.....	2	May 23, 1906..	4	1,225	61.3
	7	.....	4	March 10, 1906..	4	1,433	65.9
	5	.....	11	" 10, 1906..	4	1,540	67.7
	6	.....	5	" 5, 1906..	4	1,623	69.8
	1	.....	5	April 26, 1906..	4	1,575	70.2
	3	..	9	" 25, 1906..	4	1,750	79.2
4	5	Grade	7	" 29, 1906..	5	2,230	78.8
	3	"	6	" 26, 1906..	5	2,080	84.8
	7	"	7	" 2, 1906..	5	2,160	92.4
	8	"	3	March 28, 1906..	6	2,200	84.8
	6	"	11	May 5, 1906..	6	2,430	96.3
	9	"	4	March 25, 1906..	6	2,300	96.5
	1	"	5	May 5, 1906..	6	2,780	108.9
	4	"	5	April 10, 1906..	6	2,690	109.3
	2	"	5	" 10, 1906..	6	3,040	127.9
5	2	Grade Durham	12	June 9, 1906..	6	5,100	187.6
	8	Ayrshire	2	May 20, 1906..	7	2,789	107.8
	3	Canadian	5	April 15, 1906..	7	2,860	115.6
	9	Durham	2	May 15, 1906..	7	3,270	124.9
	7	Grade Ayrshire	6	March 30, 1906..	7	3,350	123.6
	5	Grade Durham	3	May 12, 1906..	7	3,650	133.9
	6	Durham	5	March 25, 1906..	7	3,460	139.2
	4	Grade Durham	8	April 27, 1906..	7	3,600	143.7
	1	Ayrshire	15	May 10, 1906..	7	4,190	161.4
6	10	.....	2	April, 1906..	7	2,685	112.4
	7	.....	3	March, 1906..	7	3,030	137.9
	9	.....	2	April, 1906..	7	2,915	147.0
	2	.....	7	" 1906..	7	3,320	154.3
	8	.....	4	" 1906..	7	3,875	159.8
	5	.....	3	May 16, 1906..	7	3,725	176.9
	4	.....	7	April 1906..	7	3,820	178.1
	3	.....	6	" 1906..	7	3,685	178.2
	6	.....	1	June 5, 1906..	7	4,025	179.2
	1	.....	5	March 28, 1906..	7	3,900	179.2
7	5	.....		.....	4	990	43.4
	2	Grade	5	April 27, 1906..	5	2,680	162.9
	3	"	6	" 24, 1906..	5	2,580	104.0
	4	"	4	" 16, 1906..	5	2,670	106.5
	1	Canadian	6	May 1, 1906..	5	3,530	146.2
8	3	Ayrshire	9	April 16, 1906..	6	3,450	143.2
	1	"	4	" 12, 1906..	6	3,470	148.9
	4	"	4	" 14, 1906..	6	3,860	157.2
	2	"	9	" 15, 1906..	6	4,710	195.3
	5	"	6	" 16, 1906..	6	5,220	208.0

TABLE XXX.—TOTAL PRODUCTION OF INDIVIDUAL COWS, LOTBINIERE, QUE.—Cont.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
9	10	Grade.....			5	2,559	97.8
	5	".....			5	2,760	101.8
	6	".....			5	2,730	102.9
	3	".....			5	3,140	122.7
	2	".....			5	3,070	122.9
	4	".....			5	3,590	124.9
	9	".....			5	3,290	126.7
	1	".....			5	3,530	127.6
	7	".....			5	3,440	130.0
	8	".....			5	3,670	149.8
10	12	Grade Ayrshire.....	9	March 28, 1906..	5	4,790	211.1
	7	".....	2	April 7, 1906..	6	2,790	112.9
	8	".....	2	" 6, 1906..	6	3,230	123.9
	3	".....	3	March 27, 1906..	6	3,400	129.3
	4	".....	3	" 29, 1906..	6	3,760	138.4
	10	".....	4	April 9, 1906..	6	3,810	142.3
	5	".....	5	March 29, 1906..	6	4,080	154.6
	1	".....	5	" 20, 1906..	6	4,590	165.1
	9	".....	6	April 10, 1906..	6	4,180	171.2
	2	".....	8	March 18, 1906..	6	4,880	174.1
	11	".....	5	Feb. 27, 1906..	6	4,090	178.7
	6	".....	5	March 30, 1906..	6	4,560	188.8
12	6	Grade.....	8	May 15, 1906..	5	3,400	145.6
	1	".....	6	April 8, 1906..	6	3,020	130.1
	3	".....	4	" 18, 1906..	6	3,500	143.8
	5	".....	3	May 11, 1906..	6	3,500	148.2
	2	".....	5	April 14, 1906..	6	3,970	152.2
	4	".....	9	" 27, 1906..	6	4,880	171.8
13	9	Grade.....	7	July 22, 1906..	5	2,388	88.9
	6	".....	2	June 2, 1906..	6	1,735	83.8
	7	".....	5	April 27, 1906..	6	2,705	118.4
	4	".....	3	March 24, 1906..	7	2,230	100.5
	8	".....	8	" , 1905..	7	2,045	104.0
	11	".....	8	April 5, 1906..	7	2,635	120.5
	1	".....	8	March 27, 1906..	7	2,970	121.8
	10	".....	6	April 10, 1906..	7	3,220	130.0
	5	".....	5	May 20, 1906..	7	2,758	138.1
	2	".....	15	" 22, 1906..	7	3,415	139.8
	3	".....	8	" 23, 1906..	7	5,100	190.8
14	6	".....	3	April 6, 1906..	6	3,110	126.7
	5	".....	5	May 18, 1906..	6	3,590	128.7
	4	".....	9	" 21, 1906..	6	3,374	130.9
	3	".....	6	April 23, 1906..	6	3,695	140.6
	1	".....	9	May 11, 1906..	6	3,815	142.6
	2	".....	9	" 9, 1906..	6	4,180	155.7
15	8	".....	2	March 1, 1906..	6	2,235	102.3
	7	".....	4	April 2, 1906..	6	2,530	109.1
	3	".....	2	March 2, 1906..	6	2,855	114.7
	6	".....	5	" 12, 1906..	6	3,165	128.0
	2	".....	7	June 2, 1906..	6	3,908	130.5
	1	".....	11	March 12, 1906..	6	3,985	146.8
	4	".....	13	May 5, 1906..	6	4,070	159.0
	5	".....	7	March 12, 1906..	6	4,395	161.1
16	1	".....	3	" 20, 1906..	6	3,140	137.3
	5	".....	7	April 10, 1906..	6	3,640	153.8
	8	".....	9	" 25, 1906..	6	3,920	157.3
			4	March 25, 1906..	6	3,350	160.1
	9	".....	13	April 28, 1906..	6	3,650	160.9

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TABLE XXX.—TOTAL PRODUCTION OF INDIVIDUAL COWS, LOTBINIERE, QUE.—*Contd.*

Herd Number.	Cow Number.	Breed.	Aged.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
18	3	Grade...	5	April 5, 1906..	6	3,940	169·1
	10	"	13	May 6, 1906..	6	4,110	169·3
	6	"	8	April 12, 1906..	6	3,900	171·4
	4	"	6	" 5, 1906..	6	3,790	173·0
	7	"	8	" 20, 1906..	6	3,910	174·4
18	8	.....	6	" 13, 1906..	4	2,030	77·5
	4	.....	11	Feb. 10, 1906..	5	1,850	69·1
	7	.....	4	May 3, 1906..	5	1,730	72·4
	3	.....	11	April 3, 1906..	5	2,010	75·4
	5	.....	9	" 12, 1906..	5	1,860	76·0
	2	.....	8	March 8, 1906..	5	2,070	79·8
	6	.....	5	April 25, 1906..	5	1,920	81·7
	1	.....	8	March — 1906..	5	2,510	96·2
19	10	Grade	3	April 17, 1906..	7	2,065	76·7
	8	"	3	March 18, 1906..	7	2,270	95·9
	11	"	3	April 19, 1906..	7	2,325	100·4
	7	"	5	" 18, 1906..	7	2,850	104·6
	3	"	3	March 28, 1906..	7	2,405	109·4
	6	"	5	May 12, 1906..	7	2,725	111·7
	9	"	4	April 20, 1906..	7	2,665	118·4
	5	"	13	" 16, 1906..	7	2,875	118·7
	12	"	4	" 27, 1906..	7	3,265	125·9
	2	"	12	May 20, 1906..	7	3,413	129·7
	4	"	7	April 16, 1906..	7	3,045	134·8
	1	"	8	May 24, 1906..	7	3,817	172·7

CHICOUTIMI AND LAKE ST. JOHN DISTRICTS.

In the seven following associations grouped in the Chicoutimi and Lake St. John districts, there are but few records running for four and five months or over. The summer was particularly dry, and following the consequent shortage in crop, numbers of cows were disposed of.

One herd in particular is worthy of note, that of No. 5 in the Chicoutimi association, belonging to the Seminary. The 5 months' record of 37 cows indicates an average production of 2,753 pounds of milk and 113·4 pounds of fat. Among the other Quebec associations with 5 months' records, the nearest approach to this is at Mansonville, where 44 cows average 2,808 pounds of milk and 113·3 pounds of fat. Cowansville runs only 2,077 pounds of milk, the average of 49 cows; St. Armand has an average from 26 cows of 95·1 pounds of fat.

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TABLE XXXI.—AVERAGE YIELDS OF 30 DAY PERIODS, CHICOUTIMI, QUE., 1906.

30 days ending.	Total No. of Cows.	AVERAGE.		
		Pounds of Milk.	Test.	Pounds of Fat.
July 23	154	718	3·7	27·0
August 22.....	136	596	3·8	22·6
September 21	118	481	4·3	21·0
October 21	116	352	4·6	16·3
November 20	141	281	4·6	13·1
December 18	109	218	5·0	11·0

TABLE XXXII.—TOTAL PRODUCTION OF INDIVIDUAL COWS, CHICOUTIMI, QUE.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
1	6	Guernsey.....	7	April 15, 1906..	4	1,430	65·3
	4	.....	12	" 25, 1906..	5	1,830	73·4
	3	Grade. ..	3	" 10, 1906 ..	5	1,680	74·9
	5	Canadian.	13	" 20, 1906 ..	5	1,870	85·9
	2	Grade	10	" 10, 1906..	5	2,380	92·1
	1	"	10	May 5, 1906..	5	2,940	114·0
5	6	"	7	.....	4	2,130	82·4
	41	.....	.....	.....	4	2,290	89·4
	2	Jersey	6	April 12, 1906..	4	2,050	89·6
	5	Grade	7	.....	4	2,520	94·2
	42	.....	.....	.....	4	2,310	96·1
	16	Canadian	2	.....	5	2,320	96·8
	29	.....	.....	.....	5	2,570	97·9
	39	Canadian.....	.....	.....	5	2,710	99·4
	27	" .....	.....	.....	5	2,500	100·3
	18	.....	.....	.....	5	2,680	103·7
	3	Brittany	7	March 25, 1906..	5	2,540	105·2
	22	Jersey	6	.....	5	2,590	105·2
	32	Canadian.....	7	.....	5	2,600	106·1
	8	"	4	.....	5	2,610	107·1
	11	Grade .....	.....	.....	5	2,580	107·2
	40	.....	.....	.....	5	2,770	107·5
	1	Ayrshire	4	Dec. 4, 1905.	5	2,490	107·7
	38	Canadian.. ..	4	.....	5	2,730	109·4
	28	Grade Jersey	4	.....	5	2,610	109·5
	15	Canadian.....	5	.....	5	2,500	111·9
	25	" .....	.....	.....	5	2,830	112·0
	20	"	3	.....	5	3,230	112·4
	21	"	5	.....	5	2,830	112·5
	17	.....	.....	.....	5	2,670	112·5
	14	.....	.....	.....	5	2,780	114·1
	9	.....	.....	.....	5	2,760	114·6
	31	.....	.....	.....	5	2,650	115·5
	26	Canadian .....	.....	.....	5	2,750	115·7
	19	Brittany	9	.....	5	2,720	115·7
	34	.....	.....	.....	5	2,780	116·3
	23	Grade.....	3	5	2,760	118·1
	35	5	2,900	118·8
	24	Ayrshire	5	2,790	119·0
	12	Grade	7	5	2,710	119·1
	33	5	2,970	120·2

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TABLE XXXII.—TOTAL PRODUCTION OF INDIVIDUAL COWS, CHICOUTIMI, QUE.
—Continued.

Herd Number.	Cow Number.	Breed.	Aged.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
5	10	Grade	7	.....	5	2,840	121.9
	13	"	7	.....	5	3,040	124.3
	4	"	8	.....	5	2,950	125.4
	7	Ayrshire	7	.....	5	2,980	126.0
	37	" . . . . .	.....	.....	5	3,120	126.0
	36	Ayrshire	6	.....	5	2,850	129.9
	39	" . . . . .	.....	.....	5	3,160	131.0
21	9	Grade	11	Farrow	4	1,235	50.4
	5	"	6	March 27, 1906..	4	1,690	64.3
	11	"	7	April 24, 1906..	4	1,840	73.1
	8	"	7	June 15, 1906..	4	1,970	81.4
	24	"	3	April 29, 1906..	5	1,540	70.0
	6	"	5	March 15, 1906..	5	1,975	90.4
	2	"	6	" 20, 1906..	6	1,923	82.2
	18	"	4	May 30, 1906..	6	1,985	83.4
	23	"	3	March 8, 1906..	6	1,790	85.7
	15	"	5	" 12, 1906..	6	1,800	86.3
	25	"	4	April 18, 1906..	6	1,965	89.7
	13	"	7	" 2, 1906..	6	2,265	93.2
	1	"	13	March 25, 1906..	6	2,340	94.6
	16	"	5	" 15, 1906..	6	2,225	95.5
	14	"	6	April 24, 1906..	6	2,505	93.4
	21	"	9	" 10, 1906..	6	2,610	103.7
	4	"	8	" 3, 1906..	6	2,655	103.9
	12	"	7	May 6, 1906..	6	2,365	104.4
	10	"	7	April 30, 1906..	6	2,485	110.5
	19	"	2	May 30, 1906..	7	1,552	67.9
	20	"	2	June 5, 1906..	7	1,617	74.0
	22	"	2	" 12, 1906..	7	2,117	83.4
	7	"	4	March 15, 1906..	7	2,785	115.4
	17	"	10	May 18, 1906..	7	3,375	131.3
	3	"	8	June 15, 1906..	7	3,242	148.2
22	10	" . . . . .	.....	.....	5	1,310	58.3
	9	" . . . . .	.....	.....	7	2,175	86.2
	2	" . . . . .	.....	.....	7	2,265	92.2
	11	" . . . . .	.....	.....	7	2,330	92.5
	12	" . . . . .	.....	.....	7	2,800	101.6
	14	" . . . . .	.....	.....	7	2,505	102.9
	5	" . . . . .	.....	.....	7	2,395	104.2
	3	" . . . . .	.....	.....	7	2,630	107.5
	1	" . . . . .	.....	.....	7	2,435	113.2
	4	" . . . . .	.....	.....	7	2,670	113.8
	13	" . . . . .	.....	.....	7	2,850	122.2
	6	" . . . . .	.....	.....	7	2,930	124.8
	8	" . . . . .	.....	.....	7	3,940	151.3
	7	" . . . . .	.....	.....	7	4,170	164.5
24	10	" . . . . .	.....	.....	5	2,005	76.1
	5	" . . . . .	.....	.....	5	2,385	81.7
	4	" . . . . .	.....	.....	5	2,080	84.2
	8	" . . . . .	.....	.....	5	1,940	84.4
	7	" . . . . .	.....	.....	5	2,400	90.8
	3	" . . . . .	.....	.....	5	2,450	92.8
	1	" . . . . .	.....	.....	5	2,535	96.0
	9	" . . . . .	.....	.....	5	3,110	118.2
27	8	Grade	7	May 8, 1906..	5	2,110	100.0
	10	"	10	June 28, 1906..	5	2,385	105.8
	3	"	13	" 25, 1906..	5	2,910	128.9
	6	"	10	April 17, 1906..	6	2,495	103.2

TABLE XXXII.—TOTAL PRODUCTION OF INDIVIDUAL COWS, CHICOUTIMI, QUE.
Concluded.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
27	17	"	9	May 6, 1906..	6	2,405	107.9
	11	"	8	" 6, 1906..	6	2,485	109.1
	5	"	9	April 25, 1906..	6	2,565	110.9
	1	"	4	" 15, 1906..	6	2,305	112.2
	7	"	11	May 1, 1906..	6	3,015	113.7
	14	"	9	" 14, 1906..	6	2,610	114.5
	15	"	13	April 19, 1906..	6	2,830	118.7
	2	"	4	" 18, 1906..	6	2,355	120.5
	18	"	8	May 12, 1906..	6	2,470	122.2
	13	"	14	April 30, 1906..	6	3,080	124.9
	12	"	10	May 10, 1906..	6	2,970	126.0
	4	"	6	" 25, 1906..	6	2,810	130.7
	16	"	9	April 19, 1906..	6	3,030	131.0
	9	"	8	June 27, 1906..	6	3,100	135.5
28	6	"	9	April 4, 1906..	5	1,750	69.5
	3	"	11	" 16, 1906..	5	1,670	71.5
	1	"	13	" 4, 1906..	5	2,530	117.6
	10	"	3	" 2, 1906..	6	1,540	63.6
	7	"	6	March 4, 1906..	6	2,090	85.2
	2	"	13	" 15, 1906..	6	2,330	91.5
	5	"	9	April 10, 1906..	6	2,400	99.7
	4	"	11	" 19, 1906..	6	2,450	101.3
	8	"	10	" 16, 1906..	6	2,630	112.7
	9	"	7	" 16, 1906..	6	2,550	122.6

TABLE XXXIII.—AVERAGE YIELDS OF THIRTY DAY PERIODS, BAGOTVILLE (ST. ALPHONSE), QUE. 1906,

30 days ending.	Total Number of Cows.	AVERAGE.		
		Pounds of Milk.	Test.	Pounds of Fat.
July 16	250	767	3.6	27.6
August 15	150	582	3.6	21.1
September 14.....	73	494	3.9	19.5
October 14	82	455	4.4	20.1
November 13.....	191	312	4.8	15.1
December 13.....	60	265	5.2	13.9

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TABLE XXXIV.—TOTAL PRODUCTION OF INDIVIDUAL COWS, BAGOTVILLE, QUE.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk. Lbs.	Fat. Lbs.
1	3				4	1,735	66.3
	7				4	1,710	69.3
	4			May ..., 1906..	4	2,090	72.6
	5				4	2,070	73.0
	15				4	1,950	73.4
	2				4	1,810	73.6
	17				4	1,730	74.9
	10				4	1,830	77.4
	9				4	2,250	79.0
	16				4	2,050	84.7
	13				4	2,400	86.7
	14				4	2,175	89.1
	11				4	2,005	89.3
	5				4	2,200	90.0
	18				4	2,400	92.4
	8			Jan. 8, 1906..	4	2,500	94.4
	12				4	2,280	97.2
	1				4	2,380	104.4
6	7				4	1,135	53.0
	3				4	1,385	56.9
	1				4	1,470	60.5
	5				4	1,460	61.0
	2				4	1,485	61.1
	6				4	1,365	62.6
	4				4	1,385	63.1
	9				4	1,440	64.6
11	8				4	1,415	65.7
	6				4	1,050	48.5
	9				4	1,570	64.9
	1				4	1,620	66.9
	2				4	1,490	67.2
	10				4	1,560	67.8
	4				4	1,730	69.7
	8				4	1,700	71.2
	5				4	1,790	75.3
	7				4	1,910	77.4
20	3				4	1,730	78.4
	16	Ayrshire	11	June 10, 1906..	5	2,350	97.3
	17	Canadian	16	April 10, 1906..	5	2,705	103.2
	13	"	8	May 7, 1906..	5	2,415	103.7
	1	Ayrshire	8	April 20, 1906..	6	2,065	108.1
	12	"	4	March 13, 1906..	6	2,830	109.5
	6	Canadian	13	May 18, 1906..	6	2,710	111.9
	7	"	3	April 10, 1906..	6	3,245	115.8
	5	"	8	May 22, 1906..	6	2,775	118.5
	11	"	4	April 14, 1906..	6	3,075	121.8
	2	"	10	" 28, 1906..	6	2,925	122.3
	8	"	6	May 2, 1906..	6	3,290	125.8
	10	Ayrshire	8	April 8, 1906..	6	3,455	129.7
	4	Grade	13	May 8, 1906..	6	3,760	132.4
	9	Ayrshire	7	April 19, 1906..	6	2,985	132.5
	15	Canadian	6	May 11, 1906..	6	2,855	133.2
	3	Durham	12	April 2, 1906..	6	3,525	137.5
23	14	Ayrshire	10	March 10, 1906..	6	3,790	171.1
	4		9	June ..., 1906..	4	2,020	79.6
	22				4	1,800	88.7
	23				4	2,330	90.5
	21				4	1,930	96.5
	3		3	June 8, 1906..	5	2,500	94.4

TABLE XXXIV.—TOTAL PRODUCTION OF INDIVIDUAL COWS, BAGOTVILLE, QUE.
—Concluded.

Herd Number.	Cow Number.	Breed.	Aged.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
23	9	.....	8	April 15, 1906..	5	3,050	102·5
	6	.....	4	" 20, 1906..	5	2,700	106·2
	18	.....	10	May 12, 1906..	5	2,780	107·9
	13	.....	3	" 8, 1906..	5	2,960	108·1
	16	.....	9	" 22, 1906..	5	2,980	109·4
	8	.....	16	April 15, 1906..	5	3,110	110·5
	14	.....	6	May 10, 1906..	5	2,870	111·9
	7	.....	7	April 20, 1906..	5	2,910	114·7
	17	.....	5	" 16, 1906..	5	2,850	117·5
	2	.....	5	May 15, 1906..	5	2,900	120·7
	15	.....	8	" 20, 1906..	5	2,660	124·0
	10	.....	9	April 16, 1906..	5	2,830	124·2
	12	9	May 7, 1906..	5	3,840	135·2
	11	7	" 7, 1907..	5	3,200	137·8
	1	10	June 3, 1906..	5	3,740	143·5
	5	6	March 9, 1906..	5	3,460	156·5

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SAMPLE OF SUMMARY SENT EVERY 30 DAYS TO EACH MEMBER OF ALL ASSOCIATIONS.

DOMINION DEPARTMENT OF AGRICULTURE, DAIRY COMMISSIONER'S BRANCH.

Cow Testing Associations.

The first test at Bagotville gives the very fair average of 27·6 pounds of fat per cow. The two largest herds of 34 and 37 cows are both above this average, proving what may be obtained through careful selection. Herd No. 23 has the highest average yield of milk; the lowest individual yield being 690 pounds.

It is satisfactory to note the individual records of 1,100 pounds of milk and over, which throw up in relief the 320-pound cow.

BAGOTVILLE, QUE.—LAKE ST. JOHN DISTRICT.—30 DAYS ENDING JULY, 16 1906.

Herd Number.	Number of Cows.	HERD AVERAGE.			HIGHEST INDIVIDUAL MILK YIELD.		LOWEST INDIVIDUAL MILK YIELD.	
		Milk.	Test.	Fat.	Lbs.	Testing.	Lbs.	Testing.
		Lbs.		Lbs.				
1	34	868	3·5	31·1	1,250	3·6	570	3·6
7	18	671	3·6	23·8	890	4·1	420	4·0
8	16	855	3·6	30·7	1,155	3·2	490	4·3
9	37	752	3·7	27·9	1,280	3·4	405	4·2
10	10	836	3·7	31·3	930	4·2	660	3·8
11	10	566	3·8	21·7	720	3·5	360	3·8
12	16	610	3·6	21·9	840	3·9	370	3·6
13	3	703	3·7	26·2	790	3·9	640	4·0
14	23	661	3·7	24·4	930	3·2	320	3·7
15	3	667	3·4	23·2	710	3·4	600	3·2
17	14	710	3·6	25·8	980	3·1	520	4·4
20	16	831	3·6	28·9	1,110	3·4	630	3·6
23	18	925	3·5	31·1	1,330	3·0	690	3·4
26	14	887	3·7	32·7	1,150	3·6	670	4·0
27	18	750	3·4	26·0	890	3·2	540	3·2

Number of cows tested, 250; average yield of milk, 767 pounds; average test, 3·6; average yield of fat, 27·6 pounds.

OTTAWA, July 26, 1906.

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TABLE XXXV.—AVERAGE YIELDS OF 30 DAY PERIODS, 1906, LATERRIERE, QUE.

30 days ending.	Total number of Cows.	AVERAGE.		
		Pounds of Milk.	Test	Pounds of Fat.
July 9.	28	713	3·7	26·9
August 8.	24	578	3·6	21·3
September 7.	29	465	4·0	18·9
October 7.	9	400	4·3	17·7

Most of the records in this association covered a period of only two or three months.

TABLE XXXVI.—TOTAL PRODUCTION OF INDIVIDUAL COWS, LATERRIERE, QUE.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months tested	Milk.	Fat.
						Lbs.	Lbs.
Σ	2	.....	8	.....	4	1,710	63·3
	4	.....	.....	.....	4	1,960	72·3
	3	.....	8	.....	4	1,975	76·2
	1	.....	5	.....	4	1,970	81·9

TABLE XXXVII.—AVERAGE YIELDS OF 30 DAY PERIODS, ST. FELICIEN, QUE., 1903.

30 days ending	Total number of Cows.	AVERAGE.		
		Pounds of Milk.	Test.	Pounds of Fat.
July 2.	70	614	3·8	23·4
August 1.	35	578	3·7	21·5
" 31.	59	545	3·7	20·5
September 30.	57	436	4·1	17·9
October 30.	64	303	4·5	13·6

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TABLE XXXVIII.—TOTAL PRODUCTION OF INDIVIDUAL COWS, ST. FELICIEN, QUE.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months tested.	Milk.	Fat.
						Lbs.	Lbs.
2	4	Grade	3	June 7, 1905..	5	2,270	81·5
	5	"	3	June 28, 1905..	5	2,200	89·4
	6	"	5	Feb. 20, 1906..	5	2,120	91·1
	2	"	5	April 8, 1906..	5	2,570	91·3
	3	"	5	" 2, 1906..	5	2,400	98·6
	1	"	5	" 17, 1906..	5	2,700	122·1
4	7	Canadian.....	3	March 20, 1906..	5	1,885	73·5
	8	"	3	April 18, 1906..	5	1,725	74·5
	1	"	13	March 18, 1906..	5	2,155	82·0
	4	"	5	April 20, 1906..	5	2,105	85·9
	5	"	4	" 15, 1906..	5	2,120	87·2
	6	"	4	" 18, 1906..	5	2,095	88·5
	3	"	8	March 4, 1906..	5	2,820	103·9
	2	"	9	" 12, 1906..	5	2,655	109·6
6	5	Ayrshire.....		" 1906..	5	1,690	68·7
	4	Grade.....		" 1906..	5	2,000	85·1
	6	Ayrshire.....		" 1906..	5	2,120	85·7
	2	Grade.....		" 1906..	5	2,250	88·2
	3	"		" 1906..	5	2,090	95·8
	1	"		" 1906..	5	2,190	96·2

TABLE XXXIX.—AVERAGE YIELDS OF 30 DAY PERIODS, NORMANDIN, QUE., 1906.

30 days ending.	Total number of Cows.	AVERAGE.		
		Pounds of Milk.	Test.	Pounds of Fat.
July 9.....	45	743	3·9	29·1
Aug. 8.....	47	623	3·9	24·8
Sept. 7.....	26	484	3·9	19·2
Oct. 7.....	41	502	3·9	19·7
Nov. 6.....	26	393	4·5	18·0
Dec. 6.....	36	276	5·4	15·1

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TABLE XL.—TOTAL PRODUCTION OF INDIVIDUAL COWS, NORMANDIN, QUE.

Herd Number.	Number Cow.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
1	5	Grade.....	6	April 4, 1906..	4	2,320	101·1
	7	".....	4	" 3, 1906..	4	2,440	104·8
	3	Canadian.....	6	".....	4	2,530	122·6
	8	".....	7	April 10, 1906..	4	3,090	125·7
	4	Ayrshire.....	8	March 20, 1906..	4	3,030	126·2
3	6	Grade.....	3	April 15, 1906..	4	2,010	78·5
	5	".....	6	" 2, 1906..	4	2,140	84·8
	1	".....	4	March 15, 1906..	4	2,085	86·5
	3	".....	7	" 30, 1906..	4	2,370	89·1
	9	".....	6	May 12, 1906..	4	2,190	90·4
	4	".....	9	June 15, 1906..	4	2,645	90·9
	10	".....	6	April 25, 1906..	4	2,045	91·7
	8	Brittany.....	7	" 16, 1906..	4	2,180	94·9
	7	Grade.....	3	" 28, 1906..	4	2,070	96·8
	2	".....	7	March 29, 1906..	4	2,395	105·4
6	5	Canadian.....	4	April 1, 1906..	6	2,275	105·4
	4	".....	5	" 8, 1906..	6	2,470	109·2
	3	".....	5	" 17, 1906..	6	3,290	134·7
	2	Grade.....	6	" 22, 1906..	6	3,610	137·6
	1	Canadian.....	7	March 22, 1906..	6	3,540	146·7
8	4	Grade.....	3	April 28, 1906..	5	1,715	62·8
	5	".....	3	" 30, 1906..	5	1,425	65·9
	6	".....	8	May 1, 1906..	5	2,182	84·7
	2	Jersey.....	6	April 21, 1906..	5	2,307	85·3
	3	".....	8	" 21, 1906..	5	2,330	86·1
	7	Grade.....	7	May 22, 1906..	5	2,167	90·3
	1	".....	6	April 17, 1905..	5	2,195	94·1
16	4	Canadian.....		Oct. 20, 1905..	5	2,340	112·5
	3	".....		April 25, 1906..	6	3,370	139·1
	2	".....		June 17, 1906..	6	3,755	160·8
	1	".....		June 16, 1906..	6	4,020	162·9

TABLE XLI.—AVERAGE YIELDS OF THIRTY DAY PERIODS, RIVIÈRE À L'OURS (ST AMBROISE), QUE. 1906.

30 days ending	Total number of Cows.	AVERAGE.		
		Pounds of Milk.	Test.	Pounds of Fat.
July 16.....	112	474	3·8	18·3
August 15.....	60	421	4·0	16·8
September 14.....	66	352	3·9	14·0
November 13.....	105	150	5·6	8·4
December 13.....	43	87	6·0	5·3

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TABLE XLII. TOTAL PRODUCTION OF INDIVIDUAL COWS, RIVIÈRE À LOURS, QUE

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months tested.	Milk.	Fat.
						Lbs.	Lbs.
1	5	Ayrshire		April 8, 1906..	5	1,730	70.4
	3	"		" 20, 1906..	5	2,110	78.4
	6	"		" 12, 1906..	5	1,950	86.2
	4	"		" 17, 1906..	5	2,280	86.2
	2	Canadian		March 15, 1906..	5	1,780	88.7
	1	"		" 20, 1906..	5	1,970	88.9
2	7	Grade	5	" 3, 1906..	4	900	43.2
	2	Canadian	8	May 20, 1906..	4	1,285	51.8
	5	"	7	" 25, 1906..	4	1,280	55.2
	1	"	10	April 8, 1906..	4	1,510	57.0
6	8	Grade			5	1,015	43.6
	5	"			5	1,100	49.5
	6	"			5	1,430	50.8
	3	"			5	1,430	56.6
	7	"			5	1,400	57.3
	2	"			5	1,565	62.6
	4	"			5	1,540	63.0
	1	"			5	1,545	63.7
14	4	"			4	1,270	54.6
	3	"			5	1,440	54.1
	1	"			5	2,060	82.1
	2	Canadian			5	2,080	82.6
16	9	"			4	980	45.1
	15	"			4	960	46.4
	16	"			4	1,145	49.3
	12	"			4	1,170	51.3
	8	"			4	1,190	53.3
	11	"			4	1,235	56.9
	2	"			4	1,240	57.0
	13	"			4	1,165	57.3
	5	"			4	1,170	58.7
	17	"			4	1,255	61.1
	7	"			4	1,280	61.8
	3	"			4	1,285	63.2
	10	"			4	1,285	63.5
	18	"			4	1,390	65.1
	6	"			4	1,300	73.3
17	1	"			4	1,670	75.4
	4	"			4	1,535	76.6
	4	Canadian	11	May 18, 1906..	4	1,130	47.9
	6	"	8	April 22, 1906..	4	1,250	49.0
	5	"	6	May 2, 1906..	4	1,225	52.0
	3	"	4	June 29, 1906..	4	1,210	53.0
	2	"	3	April 20, 1906..	4	1,190	54.0
	1	"	3	Feb. 20, 1906..	4	1,295	56.9
	7	"	5	May 8, 1906..	4	1,270	57.1

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TABLE XLIII. AVERAGE YIELDS OF 30 DAY PERIODS, LA DECHARGE. (ST. CHARLES), QUE., 1906.

30 days ending	Total No. of Cows.	AVERAGE		
		Pounds of Milk.	Test.	Pounds of Fat.
Aug. 22.....	60	400	4.1	16.4
Sept. 21.....	36	335	4.1	14.0
Nov. 20.....	104	151	5.8	8.8
Dec. 20.....	50	106	6.3	6.4

TABLE XLIV. TOTAL PRODUCTION OF INDIVIDUAL COWS, LA DÉCHARGE, QUE., 1906.

Herd Number.	Cow Number.	Breed.	Age.	Date of Calving.	Number of Months Tested.	Milk.	Fat.
						Lbs.	Lbs.
4	5	Canadian			4	900	41.1
	6	"			4	950	43.4
	3	"			4	970	43.8
	7	"			4	1,100	44.2
	1	"			4	1,030	45.3
	8	"			4	1,270	54.1
18	5	Grade Ayrshire.....	6		4	885	40.9
	4	"	7		4	955	47.0
	1	"	11		4	1,235	49.2
	2	"	10		4	1,190	50.4
	3	"	9		4	910	53.3

In addition to the above regularly organized associations, some further work was undertaken on the request of some farmers for a short time at Culloden, Ont., and Jonquières, Que. The results are tabulated below.

TABLE XLV. AVERAGE YIELDS OF 30 DAY PERIODS, CULLODEN, ONT., 1906.

30 days ending	Total No. of Cows.	AVERAGE		
		Pounds of Milk.	Test.	Pounds of Fat.
Aug. 17.....	47	711	3.3	23.9
Sept. 18....	48	693	3.5	24.3
Oct. 18.....	38	581	3.7	21.8

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TABLE XLVI. AVERAGE YIELDS OF 30 DAY PERIODS, JONQUIERES, QUE., 1905.

0 days ending	Total No. of Cows.	AVERAGE		
		Pounds of Milk.	Test.	Pounds of Fat.
Nov. 27.	48	175	5.3	9.3
Dec. 26.	32	127	5.7	7.2

SOME GENERAL CONCLUSIONS.

Some of the more important points revealed by a careful scrutiny of the individual yields are:—

In order to ascertain the value of a cow it is necessary to test as well as weigh her milk. Frequently there is a gross difference of 50 pounds of fat in the milk of two cows giving 4,300 pounds of milk each. Butter fat is the valuable constituent of milk

Many farmers are not only working hard, but working overtime unnecessarily, through keeping 12 cows when 7 would yield as much milk and butter fat.

Cows of mature age lower the average production of a herd just as often as heifers. Many cows are evidently kept too long.

Because his brother farmers in Ontario and Quebec are keeping (a) cows that yield 247 pounds of fat in 7 months, (b) cows that earn \$66 in 8 months, there is every reason why the ‘average farmer’ should feel greatly encouraged in the effort to improve his stock.

Careful selection of good individuals, intelligent breeding to sires of proven worth, and liberal feeding, are the sure foundation stones in building up a profitable dairy herd.

Systematic weeding will speedily increase the average production of the herd. In one lot of 29 cows, no fewer than 11 of them yielded 20 pounds of fat below the average for the season.

If a dairy herd has a certain ‘average’ production of milk and butter fat, it follows necessarily that some individual cows in the herd must be below that average, while others must be above it. The work of these associations indicates unmistakably that it pays the ordinary farmer, and pays him well, to keep records of each single cow in order that those below the average may be detected. There is no other way of discovering them. Then should follow better care, better breeding, better management, better feeding; so that those above the average may be maintained in that enviable position and still further improved. Information alone will not effect a reformation. Succeeding a careful scrutiny of the individual records there must be intelligent action. Then the ordinary factory patron will reap a good harvest, not only in augmented income from the same number of cows, or even not so many; but in the vastly increased satisfaction, interest and stimulation that improved stock and improved methods will bring.

PART II.—REPORT OF THE ASSISTANT DAIRY COMMISSIONER.

ST. DENIS (EX BAS),
COUNTY OF KAMOURASKA, P.Q., March 31, 1907.

Mr. J. A. RUDDICK,
Dairy and Cold Storage Commissioner,
Ottawa.

SIR,—I beg leave to present you my seventeenth report as Assistant Dairy Commissioner. My last report covered the whole of the year 1905. The present one, on account of the change in our Dominion fiscal year, which now ends with March, covers a period of fifteen months, beginning on January 1, 1906, and ending on this date.

SUMMARY OF WORK.

During the past fifteen months I have made 125 visits to 75 localities, in 29 counties of Ontario and Quebec. I have delivered 364 lectures before 21,286 persons, of whom 960 were cheese and butter makers. Exclusive of the lectures delivered before the students of the provincial dairy school at St. Hyacinthe, Que., the average attendance at those lectures was 77 persons. Of the 75 localities I visited 31 for the first time in my capacity as Assistant Dairy Commissioner. I have travelled 12,873 miles to perform my work.

The following is a list of the counties and localities in which I have delivered lectures, with reference letters indicating the purpose of the meetings. (See end of list.)

TABLE OF VISITS AND LECTURES.
PROVINCE OF ONTARIO.

Counties.	Localities.	Visits.	Lectures.	Reference letters.
Algoma	Chelmsford	1	1	d
	Rayside	1	1	d
Nipissing	Bleazard Valley	1	1	d
	Capreol	1	1	d
	Hanmer	1	1	d
	"	1	1	b
	Monetteville	1	1	d
	Sturgeon Falls	1	1	d
	Verner	1	1	d, b
	"	1	1	h
	Warren	1	1	d
	"	1	1	b
Carleton	"	1	1	d, f
	Ottawa	1	1	a
	"	1	1	a, f

PROVINCE OF QUEBEC.

Arthabaska	Arthabaskaville	1	3	b
	Stanford	1	3	b
Bagot	Acton Vale	1	2	b
	Ste. Hélène	1	2	b
Bellevue	Honfleur	1	2	b
	St. Charles	3	6	b
	"	1	1	b
	St. Damien	1	2	b
	St. Gervais	1	2	b
	St. Lazare	1	2	b
	St. Valier	1	2	b

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Counties.	Localities.	Visits.	Lectures.	Reference letters.
Bonaventure	Bonaventure	1	1	b
	Maria	1	1	b
	"	1	1	h
	New Richmond	1	1	b
	"	1	1	b, f
	Paspébiac	1	1	b
	Port Daniel	1	1	b
	St. Jean l'Evangeliste	1	1	b
Brome	Knowlton	1	1	a, f
Chambly	St. Basile le Grand	1	2	b
Champlain	Champlain	1	3	b
	Ste. Anne de la Pérade	1	5	b
Dorchester	St. Anselme	2	4	b
	St. Hénédine	2	4	b, h
Drummond	St. Germain	1	2	b
Gaspé	Cap Chat	2	1	b, h
	Grande Rivière	1	1	b
	Percé	1	1	b
	Ste. Anne des Monts	1	1	b
L'Assomption	St. Henri de Mascouche	1	2	h
	St. Lin	1	1	a
	"	6	11	h
	"	1	1	b
	St. Roch	2	4	h
Lévis	St. Henri	1	3	b
	"	2	4	h
	St. Lambert	1	1	h
L'Islet	L'Islet	1	1	c
Matane	Matane	1	1	b
	"	1	1	h
	Sandy Bay	1	1	b
	"	1	1	b
	Ste. Félicité	1	1	h
Megantic	Plessisville	1	3	b
Missisquoi	Dunham	1	1	d
Montcalm	St. Alexis	1	2	h
	St. Calixte	6	12	h
	St. Esprit	2	4	h
	St. Jacques	3	6	h
	Ste. Julienne	2	4	h
Montmagny	Berthier	1	2	h
	St. Pierre	2	4	h
	St. Thomas	2	4	h
Portneuf	Cap Santé	1	3	b
	St. Casimir	1	3	b
	St. Raymond	1	3	b
Quebec	Ancienne Lorette	1	3	b
	Beauport	1	3	b
	Charlesbourg	1	3	b
	Jeune Lorette	1	3	b
St. Hyacinthe	St. Hyacinthe	1	2	a
	"	1	1	c
	"	10	142	a, e
	"	2	22	a, e, f
	"	1	1	b
	Ste. Madeleine	1	2	b
Shefford	Adamsville	1	1	c
	"	1	1	c, f
	Roxton Falls	1	3	b
	Waterloo	1	1	c
	West Shefford	1	1	c
	"	1	1	c, f
Témiscouata	L'Isle Verte	1	1	b
Terrebonne	New Glasgow	1	2	h, f
	Ste. Anne des Plaines	3	6	h
	Ste. Sophie	4	8	h
Two Mountains	La Trappe, Oka	1	2	a
Yamaska	St. Guillaume	1	2	b

Reference letters indicate :—

(a) Provincial and federal conventions and courses. (b) County and district conventions. (c) Farmers' clubs meetings. (d) Parish meetings. (e) St. Hyacinthe Dairy School. (f) English lectures. (h) Factory inspections and lectures.

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The foregoing table shows that I have delivered (a) 7 lectures at provincial or federal conventions (not including the provincial courses at the St. Hyacinthe Dairy School); (b) 77 at county and district meetings; (c) 7 before farmers' clubs; (d) 11 at parish meetings; (e) 164 before the students of the St. Hyacinthe Dairy School; (f) 30 in English; and that I have made 61 factory inspections, in the course of which I have delivered 102 lectures to the factory patrons.

PROVINCIAL AND FEDERAL CONVENTIONS.

The first of the provincial and federal conventions I attended during the last fifteen months was the annual convention of the Province of Quebec Dairymen's Association, held at St. Lin, L'Assomption county, on January 23 and 24, 1906. At that convention I delivered a lecture on 'The International Dairy Congress of 1905.' I shall not give here even a summary of my lecture, as most of the reports of that congress, held in Paris, France, in October, 1905, have been published in many French and English dairy periodicals. I, nevertheless, wish to note the fact that at that congress Canada had the honour of being mentioned as having perfected a new process of buttermaking with fresh cream, without leaving it to ripen for twenty-four hours, as is generally done in the old process.

The next convention I attended was the Second Convention of Fruit Growers of the Dominion of Canada, held at Ottawa, March 20, 21 and 22, 1906. At the request of the Hon. Mr. Fisher, I delivered at that convention a short address on the experimental work done in fruit growing in the province of Quebec. It runs as follows:—

EXPERIMENTAL WORK IN FRUIT GROWING.

'It is only within the last fifteen years that we have been carrying on regular official experimental work in connection with fruit growing in the province of Quebec. Before that time very valuable work was done by Mr. Charles Gibb, of Abbotsford; by Mr. Auguste Dupuis, the first fruit grower to establish a nursery in eastern Quebec, which he did in the early sixties, at Village des Aulnaies; by the reverend Trappist Fathers, or Silent Monks of Oka, who have been very successful in fruit culture for the last twenty years, and by the Rev. Abbé Provencher, of Cap Rouge, near Quebec, a naturalist of great distinction, who has written the first, and a very good, manual in French on orchard culture. The experimental work of these pioneers of fruit culture covered a period of about forty-five years, from 1860. But this was only local work.

'Our provincial Pomological Society acted wisely when, in 1906, it presented a memorandum to our Quebec Department of Agriculture, asking for the establishment of a number of fruit experimental stations. They are doing splendid work. Twenty-five years ago we thought that fruit would not grow on grafted apple trees in the greater part of our province, especially in the eastern section. All we had in the eastern districts, below the city of Quebec, was the plums and cherries imported by the first settlers. Since the beginning of the experimental work of the fruit growers named above, and the establishment of our fruit stations, we have been growing fruit that we never thought would grow. We have fruit experiment stations in the counties of Beauce, Charlevoix, Chicoutimi, Compton, Gaspé, L'Islet, Montmorency, Quebec, Rimouski, Shefford, Temiscouata and Terrebonne. In my own section, Kamouraska district, where twenty-five years ago we had only seedling apple trees, four or five varieties of plums and one of cherries, we now grow forty-two varieties of apples, twenty-seven of plums and twelve of cherries. We grow more varieties of plums than they do in the island of Montreal or in eastern Ontario. Mr. Dupuis, the director of the fruit experimental stations, grows many more varieties than that, and all in his nursery as well as in my orchard are giving an abundance of fruit of good quality.

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Our best friend in the eastern section of the province of Quebec is snow. We have plenty of it during the whole winter, often as much as four feet. It proves a good thing for our trees, and the result is that we have trees growing which would not grow in eastern Ontario. The experimental work of our fruit stations is conducted by the Department of Agriculture at a very small cost.

'The report of these stations is published in the general report of the Quebec Department of Agriculture. A large part of our experimental work is also published in the reports of the Provincial Pomological Society, which is doing good work for our province. This society has not a very large membership, but its members are workers. They are carrying on experimental work in every part of the province, and their work is certainly equal to that of the fruit experiment stations of the other provinces of the Dominion as well as of ours. We hope that, before long, the western part of the province will be able to export large quantities of fruit and that the eastern part will grow sufficient for local consumption.

'What I have said is enough to show that we are doing good work and that we are endeavouring to keep up with the other provinces as far as climate will allow us to do so.'

The third of the provincial conventions I attended was the annual convention of the Agricultural Missionaries of the Province of Quebec, held at 'La Trappe,' the monastery of the Trappist Fathers, at Oka, on July 10 and 11. I lectured there on 'Schools of Domestic Science,' as a good means of promoting the agricultural education of farmers' daughters. It was the continuation of a series of lectures on agricultural education which I have delivered before the missionaries for the past four years.

SCHOOLS OF DOMESTIC SCIENCE.

In that lecture I indicated what is being done everywhere, and especially in France, Belgium, Germany, Switzerland, the United States and Canada, for the education of country girls, and I was also able to prove that the first school of domestic science known in our time was opened at Roberval, Lake St. John, in the province of Quebec, by the reverend Ursuline nuns in 1883.

To such schools the farmer sends his daughter to learn the new methods taught, so that she may be able to perform more easily and perfectly the work her mother had much trouble in doing by the old imperfect methods. There the young girl learns to make better butter than that of the common dairy; to bake better bread than is generally made; to get more profit from the poultry yard than it ordinarily yields; often to add to the food products the honey given by the busy bee, which responds so readily to the attention paid it by the farmer's wife; to cultivate a garden so as to have an abundance of wholesome and palatable vegetables and fruits, allowing a change in the daily diet on the farm; to prepare more economically and in more agreeable form the solid but unvaried foods of which the daily diet is composed; to make more carefully, with wool and flax, the stuffs and linens used on the farm; to cut out the clothes, to give them a better shape and to sew them more skilfully than is usually done; to become familiar with the care of the sick and the preparation of the delicate dishes they need, as well as with the laws of hygiene to be followed in regard to children; and to have a regular system of keeping accounts, which is indispensable for order and economy in the farmer's household. The girl who has a knowledge of all this is a fit companion for the farmer, and the only one who will enable him to derive all the profit possible from his industry.

The first annual meeting of the Farmers' Experimental Union of the province of Quebec, which was held at Ottawa on October 30 and 31, was the fourth convention I attended. I had been asked to prepare for that convention a lecture on

EXPERIMENTS WITH FORAGE PLANTS.

In that lecture I gave a synopsis of my own experience in growing forage plants for the last twenty years. The following is a list of the plants I have experimented with: Red-top or dew grass, orchard grass, meadow fescue, rough meadow grass, June grass, timothy, alsike, common, mammoth and White Dutch clovers and meadow foxtail.

In the following table is given the exact composition of the mixture of forage seeds I have found to be the best suited to the climate and soil of eastern Quebec. The figures given here as to the quantities required vary according to the nature of the soil.

Name of Plant.	Light Soil.	Ordinary Loam.	Heavy Soil.
	Lbs.	Lbs.	Lbs.
Clover, Alsike.....	2	2	2
" Mammoth.....	4	4	3
" White Dutch.....	1	1	1
June grass.....	5	2	2
Meadow Fescue.....	3	4	4
" Foxtail.....	1	1	1
Orchard grass....	6	8	8
Red top.....	3	5	5
Rough meadow grass.....	4	1	2
Timothy.....	5	6	6
Total per acre.....	34	34	34

In this mixture June grass, orchard grass and red-top insure an average crop in dry seasons, and meadow fescue, meadow foxtail, orchard grass, rough meadow grass and timothy insure it in wet seasons. That is the mixture for meadows.

For pastures the following has always given good results:—

Clover alsike.. . . .	2 lbs.
Clover, common red....	2 "
Clover, White Dutch.. . . .	1 "
June grass.. . . .	7 "
Meadow fescue.. . . .	4 "
Meadow foxtail.. . . .	3 "
Orchard grass.. . . .	5 "
Red-top.. . . .	3 "
Timothy.. . . .	5 "
Total.. . . .	32 "

In this mixture the clovers give a large crop of grass during the first two years, then June grass and meadow foxtail, with timothy, occupy the land. But the two plants that give an especially great value to the pasture, as to its lasting character, are red-top and orchard grass, which withstand wonderfully all excess of moisture, frost or drought.

The winter convention of the Pomological Society of the province of Quebec was held at Knowlton, Brome county, December 18 and 20, and, having been invited to attend it, I delivered there a lecture of which the following is a synopsis:

TWENTY YEARS' EXPERIMENTS IN FRUIT GROWING.

Twenty years ago we undertook some experiments in fruit culture at St. Denis, Kamouraska county, situated on the St. Lawrence river, about 90 miles below the city

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of Quebec, in 47° 30' north latitude. We give here some particulars regarding the climate of that region and the soil of our orchard.

In 43 years the lowest temperature experienced was 34° F. below zero, and the highest 96° F. The average precipitation was 28½ inches, including the snowfall, which averages 3 feet in the open country. The predominant winds are north-eastern and are saturated with salt emanations from the Gulf of St. Lawrence.

The soil of the orchard, which slopes gently to the north, is composed of sandy clay, naturally damp, but well drained. A windbreak of white spruce shelters the orchard on the north-eastern side.

At the time we began our experiments we were growing a few seedling apple trees, the Blue Damson and Montmorency plums and the common or French cherries, but practically no grafted fruit trees of any kind. Since then we have tried 51 varieties of apples, 9 of pears, 33 of plums, 13 of cherries, 12 of gooseberries, 10 of currants, 8 of raspberries and black caps, and 7 of strawberries.

As to apples, we have found that the 22 varieties classified in the following list are well suited for our district, and have a real value:

Summer Apples.—Hare Pipka, Red Astrachan, Summer or Early Strawberry, and Yellow Transparent.

Early Fall Apples.—Grandmother, Montreal Peach, Transcendant and Whitney.

Late Fall Apples.—Alexander, Duchess of Oldenburg, Hyslop, Montreal Beauty, Wolfe's River, St. Lawrence and Titovka.

Early Winter Apples.—Fameuse, McIntosh Red, Wealthy and Winter St. Lawrence.

Late Winter Apples.—Ben Davis, English Golden Russet, Longfield.

Out of these 22 varieties of apples which give good crops of well matured fruit, and which are very hardy in our district, we have selected the following as being the best varieties and the most commendable:

Summer.—Hare Pipka, Summer or Early Strawberry.

Early Fall.—Grandmother, Whitney.

Late Fall.—Duchess of Oldenburg, Titovka.

Early Winter.—Fameuse, Wealthy.

Late Winter.—English Golden Russet, Longfield.

In pear culture, after having discarded Russian varieties, which yielded only fruit of poor quality, we have been very successful in the last three years with the Flemish Beauty and the Vermont Beauty. We expect much from four varieties bought in Belgium, coming from the Ardennes Mountains, as these varieties wintered well for the past three years, including the very severe winter of 1904, and bloomed last spring.

Our experiments with plums have proved very interesting. Out of 33 varieties tested since twenty years ago, we still have under cultivation 31 varieties, of which the following 19 are bearing and give good crops of fine fruit:

Blue Damson, Canada Orleans, Coe's Golden Drop, Early Yellow, Grand Duke, Guai, John Trotter, Lombard, Mirabelle, Pond's Seedling, Purple Gage, Reine Claude de Bavay, Reine Claude de Montmorency, St. Cloud, St. Denis Seedling, Saunders, Smith Orleans, Unknown Seedling, Yellow Damson.

From these we pick the following as the best ten varieties for our district:

Blue Damson, Coe's Golden Drop, Early Yellow, Guai, Lombard, Purple Gage, Reine Claude de Montmorency, Saunders, Smith Orleans, St. Denis Seedling.

The ten varieties just indicated give plums fit to eat, from August 25 to November 10. We sold them this year at 30 cents a gallon on the trees.

We have made experiments with 13 varieties of cherries. The following 7 have proved to be very valuable:

French Cherry, maturing from July 5 to 25.

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Ostheim, Russian, maturing from July 10 to 31.

Empress Eugenie, maturing from July 15 to 31.

Montmorency, maturing from July 20 to August 5.

Bessarabian, Russian, maturing from the last days of July to the first days of August.

Lutorke, Russian, maturing from August 1 to 15.

Fonché Morello, maturing from August 10 to 31.

With these 7 varieties we can have cherries for the market from the second week of July to the last week of August.

Now, coming to the small fruits, we make our selection as follows:

Gooseberries.—Out of 12 varieties we consider as the best: Columbus, Downing, Houghton, Pearl, Smith Improved.

Currants.—Out of 10 varieties we have selected Champion, black; Fay's Prolific, red; Versaillaise, red; White Dutch.

Raspberries.—Out of 8 varieties we have kept as the best: Antwerp, red; Golden Queen, yellow; Marlboro, red; White raspberry, yellow.

We have not had much success with Black Caps and Black raspberries.

Strawberries.—Out of the 7 varieties tested we intend to grow the Lovett, Red Alpine, Red Bush Alpine, Sharpless, White Alpine and White Bush Alpine.

We have discarded only the William Belt, because it is infected with leaf rust.

We plant our apple trees 25 feet apart, in rows 30 feet apart. This is contrary to the instructions generally given by orchardists. The reason why we resort to that system is that in our severe climate the trees must be planted close together in order to protect one another from the heavy damp winds prevailing in our region. We have found that, though in Essex county, Ontario, apple trees planted 40 feet apart, twenty years ago, intermingle their branches, in our district the apple trees planted twenty years ago, only 25 feet apart, do not yet intermingle their branches. This shows that owing to the difference in climate there is a great difference in the growth, and that the reasons which are invoked as necessitating a distance of 40 feet between apple trees, (viz., that when planted closer they soon intermingle their branches, prevent the fruit from getting enough air and light, and are an obstacle to the cultivation and spraying of the orchard) do not exist in eastern Quebec.

At the same convention a special committee, composed of Messrs. W. T. Macoun, Horticulturist of the Central Experimental Farm, Robert Brodie, a director of the Quebec Pomological Society, and Mr. J. C. Chapais, Assistant Dairy Commissioner and a member of the Pomological Society, was appointed to make a list of the varieties of apples recommended for the province of Quebec. The list they have drawn up, which has been approved by the society, reads as follows:

For the district bounded on the east by the towns of Three Rivers and Sorel, and from these points west and south throughout the province, the following varieties are recommended:

Summer.—Yellow Transparent, Lowland Raspberry, Duchess.

Fall.—Langford Beauty, St. Lawrence, Wealthy, Alexander.

Early Winter.—Fameuse, McIntosh Red, Wolfe River.

Late Winter.—Canada Red, Scott's Winter, Golden Russet, Baxter and Milwaukee.

For the districts bounded by the counties of L'Islet and Charlevoix, and from Three Rivers and Sorel east and south, the following varieties are recommended:

Summer.—Yellow Transparent, Lowland Raspberry, Duchess.

Fall.—Montreal Peach, St. Lawrence, Wealthy, Alexander.

Early Winter.—Fameuse, McIntosh Red, Wolfe River.

Late Winter.—Scott's Winter, Canada Baldwin, Baxter and Milwaukee.

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For the counties of L'Islet, Kamouraska, Charlevoix and the extreme north and east from these counties:

Summer.—Yellow Transparent, Duchess, Charlanoff.

Fall and Winter.—Wealthy, Patten's Greening, Hibernial and Longfield.

Crab Apples.—Whitney, Martha, Transcendent, Hyslop.

The sixth provincial convention I attended was the annual convention of the Dairymen's Association of the province of Quebec, held at St. Hyacinthe, on January 22 and 23, 1907. That convention, the twenty-fifth held by the society, coincided with the twenty-fifth anniversary of the organization of the association, which was formed in 1882.

I delivered at the convention a lecture illustrated with 55 lantern slides, giving an historical sketch of the society and its work. The character of the lecture makes it impossible to summarize it.

I classify as being of a provincial character the thirteen courses at the St. Hyacinthe Dairy School at which I delivered lectures.

COUNTY AND DISTRICT MEETINGS.

I have delivered during the last fifteen months seventy-eight lectures at county and district meetings. Most of these lectures were delivered at thirty-four county conventions, forming part of many series of Farmers' Institute meetings that were held during the last two winters (1906 and 1907). I conducted three of those series.

The first one was held from January 29 to February 7, 1906, in the following localities: Champlain and Ste. Anne de la Pérade, in Champlain Co.; St. Casimir, Cap Santé and St. Raymond, Portneuf Co.; L'Ancienne Lorette, St. Ambroise de Lorette, Charlesbourg and Beauport, Quebec Co.; Ste. Hénédine, Dorchester Co., and St. Henri, Lévis Co. I was accompanied on that trip by Mr. J. B. Trudel, a factory syndicate inspector, of St. Prosper, Champlain Co., and Mr. T. J. A. Marsan, Professor of Agriculture at the Agricultural School of the Reverend Trappist Fathers at Oka. In that series of lectures I dealt with the following subjects: 'Good Seeds,' 'Cow Testing Associations,' 'The Bacon Hog,' 'Rural Economy,' and 'Fruit Growing.'

My second series of Farmers' Institute meetings was held in the counties of Bonaventure, Gaspé and Matane, from August 21 to September 6, 1906, both dates included, and I was accompanied by Mr. Luc Dupuis, apiculturist, of Village des Aulnaies, L'Islet Co., who lectured on Apiculture. Meetings were held at the following places: Nouvelle or St. Jean l'Evangéliste, Maria, Cascapédia or New Richmond, Bonaventure, Paspébiac and Port Daniel, in Bonaventure county; Grande Rivière, Percé, Cap Chat and Ste. Anne des Monts, in Gaspé county; Sandy Bay, Matane and Ste. Félicité in Matane county.

We began our lectures on August 21, at Nouvelle or St. Jean l'Evangéliste, where we had an audience of 75 farmers; then on the 22nd, at our meeting at Maria, we had an attendance of 150; at Cascapédia or New Richmond, on the 23rd, we had 140 hearers; at Bonaventure, the 24th, 200 hearers; at Paspébiac, the 26th, 175 hearers. At Port Daniel, where we went on the 27th, a political meeting held the same evening, which we thought would help to bring the farmers together for our meeting, completely diverted their attention, and only the Mayor and the Secretary of the Farmers' Club were present. Continuing our series, we delivered a lecture at Grande Rivière on the 28th, before 50 farmers, and another at Percé, on the 29th, before an audience of 50.

Leaving then the region of South Gaspesia and Baie des Chaleurs, the scene of our first efforts, we came back to continue our journey along the south shore of the St. Lawrence, in Matane and Gaspé counties. We delivered lectures on August 31 at Sandy Bay, before an audience of 200; on September 1, at Matane, to 75 farmers; on September 3, at Ste. Félicité, before an audience of 50; on the 5th, at Cap Chat, to 250 farmers, and on the 6th, at Ste. Anne des Monts, before an audience of 15. The

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last meeting had not been advertised by those who should have attended to the matter.

All our lectures were delivered in French, except at Cascapédia or New Richmond, where I was asked to repeat in English the lecture I had first delivered in French.

In that section of the province of Quebec the population is divided into three classes, farmers, woodmen and fishermen, none of them deriving from their respective industries all the profits available. In my lectures I endeavoured to show the great advantage to the farmers settled all along the shores of the St. Lawrence and Baie des Chaleurs in giving the first place to agriculture, so that it may be a source of mutual benefit between the farmers and those who follow the two other industries referred to. For example, the lumbering industry offers an outlet for the sale of hay, oats, potatoes, pork, &c.; the other, the fishing industry, is a source of valuable manuring material for the improvement of the soil. The offal of fish, and sea weed, varec, &c., constitute very valuable fertilizers for the soil on which they are applied. Moreover, if the people understood how to connect with these two sources of prosperity the dairying industry, which is beginning to develop in that region, they would soon make of it one of the richest sections of the province. Already dairying has gained a foothold and is very promising. We found butter or cheese factories at Maria, New Richmond, Percé, Sandy Bay, Matane, Ste. Félicité and Cap Chat. In these last localities there are two creameries in operation. We advised the farmers especially to make the most of all the numerous sources of profit which agriculture affords. The climate of that region is particularly well adapted for the production of good butter and cheese, for it favours the growth of forage plants even during the most severe droughts, such as that which prevailed last summer. Notwithstanding the drought, the crops of hay and oats in the northern part of Gaspesia were the best of any that we saw last year. The climate is also especially favourable for the preservation of milk in good condition during the warmest period of summer, owing to the cool nights, which are one of the characteristic features of those localities.

Mr. Dupuis, on his part, showed the farmers how perfectly suitable apiculture is for their climate. He met often with the prejudice, founded only on mere supposition, that bees could not winter in Gaspesia, but he very easily disposed of that. His lecture, which was practical and very clear, convinced the most incredulous, and after each of the meetings many of his hearers came to ask for further information on some particular points, and enquired where bees could be obtained.

My third series of institute meetings lasted from February 26 to March 8, 1907. I was accompanied by Messrs. V. T. Daubigny, veterinary surgeon, Terrebonne; V. Fortier, of the Poultry Division at the Central Experimental Farm, Ottawa, and Mr. J. B. Trudel, factory syndicate inspector, of St. Prosper, Champlain county.

Mr. Daubigny delivered lectures on 'The Hygiene of Cattle' and 'The Horse'; Mr. Fortier, on 'Poultry Raising on the Farm,' 'The Cold Poultry House,' and 'Statistics on Poultry and Eggs'; Mr. Trudel, on 'The Care of Milk,' and 'What Good Butter and Cheese Factories Should Be,' and I spoke on 'The Formation and Improvement of the Dairy Herd,' 'Feeding and Care of the Dairy Cow,' 'Good Seeds' and 'The Bacon Hog.'

This last series of institute meetings was the best I have ever taken part in, inasmuch as the attendance was very representative. At almost all the places visited, farmers gathered in good numbers from all the neighbouring parishes.

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In the following condensed table are given a few notes on the localities visited, the meetings held, the number of farmers at each meeting, and the success of the series.

Counties.	Localities.	Date.	1st Meeting Attendance.	2nd Meeting Attendance.	Remarks.
Chambly....	St. Basil.....	Feb. 26..	50	75	A not very numerous but good representative attendance of farmers from all the neighbouring localities, accompanied by the parish priests.
St. Hyacinthe ..	Ste. Madeleine..	" 27..	125	175	Assembly composed mostly of the local farmers.
Yamaska ..	St. Guillaume...	" 28..	200	250	A very good representative meeting.
Bagot ..	Ste. Hélène.....	March 1..	93	125	" " "
Drummond ..	St. Germain....	" 2..	180	..	Much interest taken in poultry matters by a good representative audience.
Bagot.....	Acton Vale.....	" 4..	104	180	Very attentive audience of farmers from many localities.
Shefford ..	Roxton Falls....	" 5..	75	70	Assembly composed of the local farmers, who showed much interest in poultry matters.
Arthabaska, ..	Arthabaskaville ..	" 6..	200	180	A large gathering of farmers from many localities. The reverend brothers from the college attended with their pupils. Much interest was taken in dairy matters.
" ..	Stanfold.....	" 7..	95	75	People here take great interest in poultry raising. Audience seemed highly interested in all the lectures.
Megantic.....	Plessisville.....	" 8..	300	400	The last and largest meeting of the series. Farmers from distant localities present.
8 counties.....	10 localities...	10 days.	1,422	1,530	Audience highly interested in dairy and poultry matters.
Total attendance			2,952		

Besides the county meetings mentioned above I attended four others. Two of these were held at St. Charles, Bellechasse county, and St. Lin, L'Assomption county, where Mr. J. D. Leclair, general inspector of butter factories of the province of Quebec, met the buttermakers of these two counties at a joint meeting. Another meeting was held at L'Isle Verte, Temiscouata county, for the purpose of organizing a new factory syndicate; and another at St. Hyacinthe, on April 26, 1906, being a convention of all the Farmers' Clubs of the Diocese of St. Hyacinthe, under the auspices of His Lordship the Bishop of St. Hyacinthe.

LECTURES BEFORE FARMERS' CLUBS.

Many of the lectures I have mentioned above as having been delivered by me during the last fifteen months were delivered before farmers' clubs taking part in the conventions just referred to. Besides these I lectured before seven others, delivering lectures which have already been mentioned in this or in previous reports. The number of those clubs continues to grow in the province of Quebec, and they are a source of great progress in agriculture.

LECTURES AT PARISH MEETINGS.

In reference to the lectures at parish meetings, of which I have delivered eleven during the period covered by the present report, I append hereto a report of a visit made last year to New Ontario:

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VISIT TO NEW ONTARIO.

I beg leave to place before you my report of a trip undertaken on September 19, 1906, for the purpose of delivering a series of lectures in parts of Algoma and Nipissing districts, New Ontario.

I lectured at Chelmsford and at Rayside, in Algoma, and at Blezard Valley, Hanmer, Capreol, Warren, Verner, Sturgeon Falls and Monetteville, in Nipissing. The series was begun at Chelmsford, on September 21, where I had an audience of 120 farmers. At Rayside, on the 22nd, there was an audience of 90; at Blezard Valley, on the 23rd, an audience of 200; at Hanmer, on the 24th, an audience of 75; at Capreol, on the 25th, an audience of 75; at Warren, on the 27th, an audience of 35; at Verner, on the 28th, an audience of over 300; at Sturgeon Falls, on the 29th, an audience of 50, and at Monetteville, on October 1, an audience of 100.

As all these localities are settled mostly by French-Canadian farmers, I delivered all the lectures in French, except at Warren, where I was requested to repeat my lecture in English.

To show what is being done concerning agriculture in those rather newly settled agricultural districts, I cannot do better than give a summary of the lecture I delivered in each of them.

'We find that the population of New Ontario, in the section I have visited, is composed partly of farmers and partly of workingmen engaged in mining and lumbering. These workingmen having to be fed, the farming population has a ready open local market and the best of opportunities to sell the products of their land. Hitherto the farmers have done almost nothing but grow hay, oats and potatoes. These they sell readily and at a good price, hay being worth from \$12 to \$15 a ton, oats \$1.50 per 100 lbs., and potatoes \$1.50 per bag.

'But if the farmers continued to sell the raw products of their lands in this way, they would soon ruin the fertility of the soil, as has been done by the farmers of the old settlements of the country. Every ton of hay sold takes away from the farm 31 pounds of nitrogen, 8.20 pounds of phosphoric acid, and 26.40 pounds of potash. As nitrogen is worth about 14 cents, phosphoric acid 6 cents and potash 5 cents per pound, a farmer selling one ton of hay sells \$6.35 worth of the fertility of his land. If, on the contrary, he feeds his hay to cows, he keeps 80 per cent of the fertilizing elements contained in that hay, on the farm, by the application of the manure from the cows, and has cheese or butter to make money with, and whey or skim-milk to feed pigs or calves, which are another source of profit.'

(This demonstration was well understood by the farmers, and one of them at Rayside told me that ten years ago he used to gather two and a half tons of hay from an acre of his land, but that, having since then kept growing hay and selling it from the same land, he gets now no more than one ton per acre.)

'It is, then, a good thing for the New Ontario farmers to study dairy husbandry in all its details and begin immediately to raise stock, in order to take part in the movement in which the farmers of other sections of the country have joined. For that purpose they have to inaugurate on their land a good system of rotation, to grow plenty of clover, to keep large herds of good hardy breeds of dairy cows, and to raise pigs in connection with dairying. They have a ready market for butter, cheese and pork. They must strive to meet the requirements of such a good market, which will enable them to make plenty of money out of their land, and in the meantime they must keep the land continuously in a good state of fertility.'

The lands I saw during my trip are very suitable for the growing of grasses and clovers. The aftermath of clover on the fields at the end of September was really remarkable.

There is one thing very much needed in this section of Ontario, and that is good grist mills. After many of my lectures I was told by farmers that they are raising no more pigs than necessary for the use of their families, because ground feed is too

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expensive for them, and as they have to feed their pigs with whole grain, there is no profit in it, and they make more money by selling the grain.

I saw a cheese factory at Hanmer and a creamery at Verner. Those factories were established only a short time ago, and circumstances seem to have been adverse to them at first. Of course, much more benefit will be derived from such factories when, through co-operation, a large number of them will have been established. I hope that if we follow the course of giving a few lectures now and then on dairy husbandry in that section of the country, dairying will develop quickly, as everything there regarding the land, the climate and the stock seems perfectly adapted for such development.

SUNDAY WORK IN FACTORIES.

A new feature was added to my work last year, that of fighting against Sunday work in butter and cheese factories. By special request I delivered a short series of six lectures, in four localities, on that question.

ST. HYACINTHE DAIRY SCHOOL.

Most of my time last winter, last fall and this winter was devoted, as usual, to the St. Hyacinthe Dairy School, where I delivered lectures on dairy husbandry to the students attending its courses. I attended six of these courses from January to April, 1906, and seven from November, 1906, to March, 1907, both months included. The courses lasting from November, 1905, to April, 1906, were attended by 180 students, 118 for buttermaking, 52 for cheesemaking and 10 for a special course. From November, 1906, to March, 1907, the courses were attended by 151 students, 85 for buttermaking and 66 for cheesemaking. I have delivered to those students 142 lectures in French and 22 in English.

FACTORY SYNDICATES AND SYNDICATE INSPECTION.

This year I organized one new syndicate in Temiscouata county. I also inspected two syndicates, one in L'Assomption, Montcalm and Terrebonne counties, and one in Montmorency, Bellechasse, Dorchester and Lévis counties, in company with the local inspectors, who had asked to have the inspection made. In making it I travelled 918 miles, inspected 46 factories, and delivered 102 lectures, in 23 days, in 25 localities. I also inspected 15 other factories which were not included in any syndicate.

DEATH OF MR. EMILE CASTEL.

I am sorry to have to close this report with a reference to a sad loss, that sustained in the death of Mr. Emile Castel, the worthy and esteemed secretary of the Dairymen's Association of the province of Quebec, and secretary of the St. Hyacinthe Dairy School. He passed away on March 30th instant, at the age of 53, and his death will certainly be a great loss to the dairy industry of the province of Quebec, for he was one of the most prominent and able dairymen of the province. He was secretary of the Dairymen's Association for the last fourteen years.

I have the honour to be, sir,

Your obedient servant,

J. C. CHAPPAIS,

Assistant Dairy Commissioner.

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PART III.—EXTENSION OF MARKETS.

OTTAWA, March 31, 1907.

J. A. RUDDICK, Esq.,Dairy and Cold Storage Commissioner,
Ottawa.

SIR,—I have the honour to submit a report of the Extension of Markets Division for the year ended March 31, 1907.

Throughout the past year this division has continued its work for the improvement of the transportation facilities for our export food products, with, I am pleased to be able to say, gratifying results. During the summer months a closer inspection was maintained over the refrigerator car services for butter, cheese and fruit, and, as a consequence, these services were operated in a more satisfactory manner than ever before. Careful attention was also paid to the handling of our food products received at the loading ports, and rough work was, as far as possible, suppressed. The loading of these products in the steamers, the ventilation of the holds in which they were stowed, the temperatures maintained in the cooled air and refrigerator chambers, the unloading at ports of discharge in Great Britain, &c., were carefully noted by a staff of trained men, and any defects in the service or complaints *re* handling or stowage were promptly brought to the attention of the steamship companies concerned. Every cargo of perishable products, whether large or small, carried from the ports of Montreal and Quebec (and in the fall and winter months from St. John and Halifax), had an inspector in attendance while loading was going on, and also at the ports in Great Britain while these cargoes were being unloaded.

In addition to the work outlined above, the Markets Division has had considerable correspondence with firms in Great Britain and other European countries, seeking to establish business relations with shippers of Canadian farm and food products. In each case the desired information was duly furnished, and at the same time, the inquiries were brought to the notice of the interested parties in this country.

By direction of the Honourable the Minister of Agriculture, the Chief of this Division was engaged, from June 13 to August 16, in an investigation of the meat packing establishments in Canada, in order to ascertain the conditions under which this industry is carried on. On completion of the investigation a full report was submitted to the minister.

CARGO INSPECTION AT MONTREAL AND QUEBEC.

During the greater part of the season of navigation seven cargo inspectors were employed at Montreal and Quebec, and furnished reports on each cargo of food stuffs shipped from these ports. Their reports gave the following details: name of steamer and line; destination; sailing date; special ventilation, if any; number and condition of refrigerator chambers; number of cooled air chambers; quantities and kinds of produce carried in these chambers; comments on the handling of the cargo; number of thermographs placed in ship and when, where, and with what cargo placed; number of boxes of cheese carried, and the following particulars of as many lots as the inspectors could take note of: factory brand, shipper's brand, shipper, number of boxes, per cent of breakage in each lot, method of loading, where stowed in ship, condition of cheese and how dunnaged; number of packages of butter carried, with marks, shipper's name and number of boxes or tubs in each lot, condition of packages, where stowed in ship, kind of goods, if any, stowed in the same chamber, and condition of

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chamber; number of cases of eggs, bacon and other produce carried, with full details, as above; number of barrels and boxes of apples, with date of inspection, shipper's name, brand, packer's name and address, number of barrels or boxes in each lot, variety, grade, number examined, number wrong under Fruit Marks Act and section violated, temperature of shed and fruit, where stowed in ship and condition of apples, packages, &c. This apple form was filled out conjointly by the Fruit Marks Act inspector and the cargo inspector. The cargo inspectors also took the temperature of a number of packages of butter in each shipment, at the same time marking these packages so that they could be easily distinguished when unloaded at the port of discharge.

Although these cargo inspectors have no legislation behind them and are not, therefore, in a position to order this or that to be done, their work, nevertheless, is carried on with the sanction and approval of the steamship companies, who recognize that, in the long run, it is for the good of their business as well as for the good of the country at large. Occasionally some slight friction occurs, but in the main the relations existing between the inspectors and the dock superintendents and other steamship officials with whom the inspectors are in daily contact, are entirely harmonious.

If one of the stevedore's men, working either on the dock or in the holds of the ship, persists in handling perishable goods roughly after having been warned by the inspector, all the latter has to do is to report the offender to the dock superintendent, who will usually discharge him unless there is an immediate and lasting reform. In this respect alone the oversight exercised by the inspectors has been productive of incalculable benefit to both the shippers and carriers of perishable goods. The very fact that the men who work on the docks know that there is an inspector around tends to make them careful, because they realize that one or two complaints registered against them will mean their discharge. To illustrate this phase of the work I quote herewith a few comments from the Montreal inspectors' reports for the season of 1906:

Liverpool Service.

SS. ———, sailed May 12.

'A number of cheese boxes were broken by using shutes for loading. I went to the foreman and had him place stuffed sacks at the bottom of shutes for the boxes to strike against.'

SS. ———, sailed June 9.

'The cheese stowed in No. 6 hatch were very roughly handled, quite a number of boxes being broken. I spoke to the men a number of times, but they did not pay any attention to me until I went to the superintendent, who sent a man down to watch them. They handled them better after that.'

SS. ———, sailed June 23.

'Some cheese were handled very roughly with the platform slings. I spoke to the men two or three times, but they paid no attention to me. I then went to the superintendent, who came and told the men they were to do as I said or he would discharge them all, which had the desired effect.'

SS. ———, sailed July 14.

'The cargo on this steamer was handled as carefully as possible. They kept a man at the hatch watching the men stowing the cheese in the ship. I had to speak to the carters several times for breaking boxes, and had to threaten to telephone the firms they were drawing for, which made them more careful.'

SS. ———, sailed September 15.

'I had to speak to the men a couple of times for handling the cheese roughly, and

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the foreman threatened to discharge them if he saw them again. I threatened to report a couple of the carters and one helper for throwing the cheese, after which they were handled very carefully.'

London Service.

SS. ———, sailed September 1.

'The cargo on this ship was handled very well. I had to speak to the shore captain about the patent drop, as the men had not fixed it properly, and were dropping the cheese about six inches, thus breaking several of them. He immediately had it remedied.'

SS. ———, sailed September 29.

'The cargo on this ship was handled a little rougher than usual, as the boat was late, and they were rushing to get her out on time. I spoke several times to the men who were handling the apples and cheese, then I went to the shore captain, who told the foreman to handle the goods carefully and not break them if the boat stayed here a week. After that they were handled very much better.'

SS. ———, sailed October 27.

'Cargo handled carefully, with the exception of apples from railways by teamsters, who had to be cautioned several times for careless work.'

Glasgow Service.

SS. ———, sailed June 14.

'Some of the cheese were handled very roughly. I spoke to the men, but they did not pay much attention. I got the foreman and he cautioned them, but still they kept on, and finally he discharged two of them. After that it was handled splendidly. Cheese stowed in No. 2 hatch were roughly handled. I spoke to the foreman, who went down into the hold and changed the men, and the cheese were then handled much better.'

SS. ———, sailed June 20.

'The cargo on this steamer was loaded in good condition and handled very carefully. The men are all watching for us now, as they have been told that if we report any of them they will be discharged. The greatest trouble now is with the carters dropping the boxes on the side of the wagon. A large number of boxes are broken in this way.'

SS. ———, sailed August 9.

'The cargo on this ship was handled a little roughly at times. I spoke to the foreman who was handling the butter and cheese. He was a new man and did not pay much attention, but went on handling them roughly. I spoke to the captain, who immediately went to him and gave him a severe talking to; after that they were handled very well.'

IMPROVED LOADING FACILITIES AT MONTREAL.

Of late years there has been a decided improvement in the handling of cheese by the steamship companies at Montreal. The rope nets, which were universally used a few years ago to transfer cheese and other products from the dock to the holds of the ship, have now almost entirely disappeared. This division has paid particular attention to this question and has taken every opportunity to urge the steamship companies to provide better facilities for the loading of such products as cheese, butter, eggs,

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&c., so that breakage at this stage of their transportation would be reduced to a minimum. Last season the platform truck was in pretty general use for loading purposes, but a few of the steamship companies adopted a cross between the 'rope net' and the 'platform truck,' which is termed the 'platform sling.' Believing that this contrivance is not as satisfactory as the platform truck, a letter was sent on June 9, 1906, to those companies making use of it, of which the following is a copy:—

‘OTTAWA, June 9, 1906.

‘*Re Loading of Cheese.*

‘DEAR SIRS,—The use of rope nets for the loading of cheese into the steamers at Montreal was, last season, pretty generally discarded, with great benefit to the trade, because it is practically impossible to load cheese with nets without more or less breakage of the boxes. At present your company are using what we term the platform sling, which is a decided improvement on the net, but which we believe is not so good a device as the platform truck, which is loaded on the dock with cheese, hauled up the gangway and lowered into the hold without any change in the position of the boxes. The platform sling, after it leaves the gangway, is suspended by one end, and as the boxes are more or less bunched while being lowered into the hold, they are thus subjected to considerable strain, which is often sufficient to break the weaker boxes. Then when the sling is landed in the hold, the boxes at the end of the sling strike bottom first, and unless the lowering is carefully done, further breakage is liable to occur. With the platform truck there is no danger of damage from either of these causes.

‘It is possible that your dock superintendent, who is a practical man and thoroughly understands his business, may know of some disadvantage possessed by the platform truck that has not been brought to my attention, but so far as our cargo inspectors have observed, coupled with what I have seen myself during my frequent visits to Montreal, the platform truck is the more satisfactory contrivance of the two for the safe loading of cheese.

‘Loading by means of chutes is another method that is used at times by most of the Montreal steamship companies. If buffers are properly placed and the brake carefully attended to, there should be scarcely any breakage of boxes, but if the men are allowed to get careless, as many boxes are apt to be broken by this method as by any other.

‘I bring this matter to your attention because I believe that you are anxious to have your steamers provided with the very best facilities for the safe loading of perishable products, and that any suggested improvement will receive your careful consideration.

‘Your very truly,

‘(Signed) W. W. MOORE.

‘*Chief, Markets Division.*’

Replies received from the companies concerned stated that they were desirous of having the best and most up-to-date appliances for the careful handling of perishable produce, and that the matter would be carefully investigated. One company pointed out that in the old freight sheds, owing to the difference in the levels of the floors, it was not convenient to use the platform truck, but as soon as they could get into the new sheds then building, they would adopt the best device obtainable.

During the warm weather last season, our inspectors found that there was a tendency on the part of the two steamship lines to allow butter to remain for several hours in the steamship freight sheds before being loaded in the ship's refrigerator chambers. This was reported to our Chief Inspector, who at once waited upon the superintendents of the lines in question, and requested them to see that during warm

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weather the butter was loaded as soon as possible after being delivered in the shed. Instructions were given to this effect and the butter was loaded promptly thereafter.

The greatest difficulty our inspectors have now to contend with is rough handling by the teamsters who draw the butter, cheese, apples, &c., from the railway cars or warehouses to the docks. These men are only anxious to get rid of their loads as quickly as possible, and unless they are continually watched they will unload boxes of butter or cheese, or barrels of apples with as much unconcern and lack of care as if they were handling pig iron. Our inspectors check them as much as possible, but they cannot always be on hand when the teamsters are unloading, as their duties frequently call them to other parts of the shed or into the holds or chambers in the ship. This season, however, it is our intention to have the inspectors pay particular attention to this phase of their work.

CANADIAN PRODUCE AT PORTS IN GREAT BRITAIN.

Liverpool.—In the last annual report an extended reference was made to the conditions under which Canadian perishable products, particularly butter, are handled at the port of Liverpool. Considerable correspondence, exchanged between this branch and the Mersey Docks and Harbour Board (the controlling power in connection with the Liverpool docks) was quoted, and it was shown that Canadian butter after being landed from the ship's refrigerator chamber, was allowed to remain in the ordinary dock sheds for periods ranging from 24 to 72 hours. During the season of 1906 some improvement was manifest, but our inspectors' reports show that from June 19 to October 24, 10,045 packages of Canadian butter were left on the docks for two days and that 2,660 packages were left on the docks for three days and over. The butter that remained for three days usually showed a very considerable change in temperature: for instance, 660 packages were landed from the SS. *Southwark* on July 20 and were not removed within the three-day limit. When landed the temperature of the butter was 21 degrees, but three days later, when the second test was made, the temperature was 59 degrees. The last three years there has been a good deal of agitation over this question among the members of the trade, both in Canada and in Liverpool, and it has also received considerable attention from the Liverpool press. In this connection we have to thank the *Liverpool Journal of Commerce* for the prominence it has given to this matter and for its fair advocacy of our case. There is no doubt that all this publicity has had a most beneficial effect, and recent developments warrant the hope that the state of affairs complained of in the past will soon be remedied. At the time of writing the position is as follows:—

First, the Allan Steamship Line have made arrangements with the Imperial Cold Storage Company for the issue of bills of lading for delivery at shipper's risk, but at ship's expense, at the Canada Dock Cold Stores, at a through rate including dock dues, cartage, portorage, a week's cold storage and delivery within a two-mile radius, of the following products: cheese, bacon, fruit, chilled beef, butter, frozen poultry, meats and fish.

Second, the Canadian Pacific Railway Company have secured authority to erect a cold store on the Sandon dock, where their ships are berthed, and have intimated that cold storage accommodation for the products mentioned above will be provided about the first of July next. The goods will be stored for one week and delivered to consignee's order within certain limits. Storage and delivery charges, dock dues, portorage, cartage, &c., will be included in the through rate.

In the last three years Liverpool's share of the imports into the United Kingdom of Canadian butter and cheese has been steadily declining. In support of this assertion I submit the following table which, taking the total quantities of butter and cheese shipped from Montreal to London, Bristol, Liverpool, Glasgow and Manchester in the seasons of navigation in 1904-5-6, shows the percentage of each product shipped to each port.

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Butter shipments from Montreal to the ports named in Great Britain, during seasons of navigation in 1904-5-6.

Ports.	1904.	1905.	1906.
	p. c.	p. c.	p. c.
London	25	37	44
Bristol	31	27	30
Liverpool	29	27	16
Glasgow	7	7	8
Manchester	8	2	2
	100	100	100

Cheese shipments from Montreal to the ports named in Great Britain, during seasons of navigation in 1904-5-6.

Ports.	1904.	1905.	1906.
	p. c.	p. c.	p. c.
London	43	45	49
Bristol	19	20	21
Liverpool	29	27	22
Glasgow	5	4	5
Manchester	4	4	3
	100	100	100

From the above figures it will be seen that in the three years mentioned Liverpool has been falling behind in receipts of both butter and cheese, that London has been making large gains, while Bristol and Glasgow have been about holding their own.

Glasgow.—I regret to state that very little improvement was shown last season as regards the removal of Canadian butter from the Glasgow docks. The bulk of the butter landed from each steamer was removed with fair despatch, but a quantity was usually allowed to remain on the quay for from five to seven days, regardless of temperature. The reason for this state of affairs is as follows: A Glasgow or Leith firm may purchase butter in Canada to be shipped by a certain steamer, but before the vessel reaches Glasgow all or a portion of that firm's consignment may be sold to customers in Glasgow, Leith, or in neighbouring towns. The butter is sold 'to arrive' and as soon as the importer receives his documents from the Canadian shipper he forwards delivery orders to those who have bought the butter, and then washes his hands of the whole transaction. The butter, of course, lies on the dock in the importer's name, but he is not then the owner, although he naturally gets the blame for the delay. If the whole or any part of a consignment is not sold before the boat reaches port, it is quickly removed to the importer's cold store, as the latter appreciates as well as anyone the value of keeping butter at a low temperature. Many of his customers, however, are either not so much impressed with the importance of cold storage, or else are simply negligent, with the result that anywhere from five to seven days may elapse before they remove their butter from the dock to their own premises. That the reports on this subject made from time to time by this division have caught the attention of importers is shown by the interesting letter that I received from Messrs. W. & M. Gilmour, produce merchants, Glasgow, which reads as follows:—

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' GLASGOW, January 7, 1907.

' Mr. W. W. MOORE,

' Chief, Markets Division,

' Department of Agriculture, Ottawa.

' *Landing and Delivery of Butter from Canada.*

' DEAR SIR,—As we note from your various reports issued in book form that considerable interest is being taken by your Department of Agriculture *re* the conveying and landing of Canadian butter and cheese, also the neglect which is sometimes shown both in Glasgow and at other ports in the removal of same from quay after goods have been landed, we beg to direct your attention to a specific case in which we are concerned, but in which we are not the defaulters. From bill of lading inclosed you will observe that consignment referred to consisted of 80 boxes finest Canadian butter, marked 'Athol,' Nos. 43/45, and which arrived at Glasgow per Allan line SS. *Mongolian*, on November 19, 1906. Documents were sighted by us on November 20, and delivery order granted by Messrs. Allan on same date, proof of which is given on bill of lading by Messrs. Allan's date stamp. This butter we sent our contractor for immediately, but notwithstanding repeated inquiries at the quay during the next two days, it will probably surprise you to learn that delivery was not received by us until November 23, three days after we had taken up documents. From inquiry made on the spot in connection with this matter, we learned that no blame was attached to Messrs. Allan, as goods, we understand, were duly delivered from steamer within regulation time, the fault, we are advised, being entirely with the Customs in their dilatoriness in passing the goods. As you are no doubt aware, it would simply be a matter of impossibility on our part to get at the Customs directly on a matter of this kind; indirectly we hope to obtain our point through your Department of Agriculture; not that any particular good can be done now in connection with this consignment, but future shipments may receive prompter attention from Customs here if your government take up the matter in a spirited manner, and occurrences of this kind obviated in future seasons.

' We may mention that at this particular time referred to, we in Glasgow were experiencing extremely mild weather, in fact, we were passing through a heat wave, which was certainly unusual for our district at that time of the year. The result was that the lot of butter referred to was carted into our warehouse in a very soft condition, and in a manner showed a serious defect in point of quality. Here we have ample proof, if proof were required, that unless butter of this kind is handled very carefully, both at port of shipment and at port of delivery, and an earnest endeavour made to protect it as much as possible from changes of temperature, a serious injustice may be done to Canadian butter, and an evil reputation cast upon it by consumers. On the other hand, we have proved to our own entire satisfaction by experiments carefully carried out, that if the butter is removed from quay and conveyed to cold storage immediately after landing, any little extra cost is fully recompensed by the satisfaction obtained in distributing the butter to our buyers in perfect condition, thereby insuring a regular trade with regular customers, to our own and their satisfaction.

' We make it a strict practice of taking up documents immediately they are sighted in Glasgow for all consignments of butter, and in cases which have occurred during the past seasons, where a steamer has at times arrived in advance of documents, we have gone to the trouble of getting a banker's guarantee, so that goods might be removed at once from quay direct to cold storage. So much satisfaction have we obtained from following out this rule strictly, that we can well understand the good intentions of your department in endeavouring to get all importers to give this matter their earnest attention. We trust your suggestions in this direction will be acted upon, and thus enable Canadian butter to be delivered to the consumer in prime condition;

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if so, Canadian butter will, we are convinced, in a very short time occupy a position alongside the two finest butter which the world produces, viz., Danish and New Zealand.

‘We quite admit that there is still room for further improvement in the make of Canadian butter, but this is a matter we are willing to leave in the hands of your different dairies, as the suggested improvements and instructions given by your dairy experts, if acted upon, are bound to have a good effect. In our opinion they are one and all in the right direction, and without intention to flatter in any sense, we say honestly that no government has done, and is still doing, more towards perfecting the development of the very highest and admittedly best system in the production and distribution of dairy produce than has the government of Canada.

‘We shall be pleased to have your acknowledgment of our letter, and also shall be pleased to fall in with any idea or proposals which you are likely to bring before our notice for the further development of Canadian produce imported.

Yours truly,

‘(Signed) W. & M. GILMOUR,
‘Per THOS. MORRISON.’

This communication was laid before the Honourable the Minister of Agriculture, who wrote to Lord Strathcona, High Commissioner for Canada, London, asking him to unofficially bring the complaint made by Messrs. W. & M. Gilmour to the attention of the Imperial Customs authorities. This was done, and his Lordship was furnished with a statement from the collector at Glasgow to the effect that the Customs were blameless in the matter, the fault resting with the consignee.

As this report goes to press the Allan Line Steamship Company announce that they have arranged for the cold storage of perishable goods at Glasgow for the season of 1907. Bills of lading for butter, cheese, bacon, fruit, meats and poultry will be issued to include cartage from the Glasgow docks to Milne’s cold store and delivery therefrom. It is to be hoped that these arrangements will prove satisfactory and that full advantage will be taken of the facilities provided.

London.—As I stated in last year’s report, Canadian perishable produce is exceedingly well handled at the port of London, the facilities provided at the Surrey Commercial dock being first-class in every respect. In December last our inspector reported that the dock company were completing extensive installations of cheese conveyors in the Canadian Produce Warehouse, which he stated would be shortly in operation. In connection with these conveyors, the Thomson line had four powerful elevators in course of construction, by which means the cheese would be taken from the ship’s holds and deposited automatically in the cold stores at an estimated rate of 6,000 boxes per hour, thus greatly minimizing the amount of handling and trucking. Owing to the better methods of handling, the percentage of broken boxes *ex* steamers at this port is infinitesimal compared with the returns of four years ago.

Prior to 1906 the Furness-Withy Steamship Line, running steamers between Halifax and London, landed their apple cargoes at the Victoria dock, but last fall the company changed their terminus to the Surrey Commercial dock. This improvement was referred to by our London inspector in his report on the first cargo of Nova Scotian apples (which arrived on September 24), as follows:—

‘This being the first shipment of apples from Nova Scotia this fall, a word respecting the London changes may be of interest.

‘As you are aware, the bulk of Canadian produce is landed at the Surrey Commercial dock under conditions that have given the greatest satisfaction, and the value of the accommodation afforded has been generally recognized.

‘Recently the Furness-Withy line transferred their steamship traffic from the Victoria to the Surrey Commercial dock, and have taken up a berth situated on the north side of Greenland dock, a plan of which I attach.

‘As regards the handling the fruit, the new premises are sure to meet with the

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approval of all parties concerned in placing fruit in the hands of the consignees in the best possible condition. Both from the geographical position of the new dock and the special advantages afforded by the equipment provided there for perishable products, the advantage of being delivered direct from the ship to warehouses within the cartage area of the chief markets is so important and substantial that shippers may confidently look to London as a market where the shipping conditions at this particular dock are of the highest possible standard.'

Bristol.—From reports received throughout the season from the cargo inspector at Bristol, there is no doubt that produce landed at Avonmouth (the port of Bristol), received careful handling and prompt despatch, the butter being forwarded in refrigerator cars as soon as landed. On the new dock, which has been in course of construction for some time past and is now well advanced, ample provision will be made for the safe and rapid handling of Canadian food stuffs.

EXPORTS OF CANADIAN FARM AND FOOD PRODUCTS.

The following comparative statement shows the value of the principal farm and food products exported from Canada, (a) to all countries, (b) to the United Kingdom, during the year ended March 31, 1907; also the value of imports of similar products into the United Kingdom during the same period.

Products.	VALUE OF SOME CANADIAN FARM PRODUCTS EXPORTED IN THE YEAR ENDED MARCH 31, 1907.		Products.	Value of products of the same sort imported into the United Kingdom from all countries in the Year ended March 31, 1907.
	To all Countries.	To Great Britain.		
	\$	\$		\$
Butter.....	4,011,609	3,805,925	Butter.....	113,027,296
Cheese	22,006,584	21,909,878	Cheese	37,122,378
Eggs	556,557	521,656	Eggs.....	34,495,916
Poultry, dressed or undressed..	74,057	54,159	Poultry.....	4,051,641
Bacon.....	9,018,470	9,012,496	Bacon.....	71,571,720
Hams	203,652	183,809	Hams.	16,785,655
Pork.....	47,293	12,012	Pork.....	7,183,652
Wheat	20,397,629	19,566,017	Wheat.	161,828,930
Flour.....	4,095,297	2,352,444	Flour.....	30,302,329
Oats.	1,855,300	1,566,996	Oats	21,251,424
Oatmeal.....	544,455	488,609	Oatmeal....	2,454,517
Peas	643,281	330,514	Peas	3,134,693
Barley	637,571	593,277	Barley.....	28,910,949
Cattle	10,932,539	10,200,137	Cattle.....	45,945,864
Sheep and lambs	1,302,824	227,186	Sheep and lambs	914,144
Apples.....	2,634,608	2,511,195	Apples.....	9,134,329
Totals	78,961,636	73,336,430	.....	588,114,837

THE EXPORT BUTTER TRADE.

The total quantity of butter exported from Canada during the year ended March 31, 1907, was 18,078,508 pounds, valued at \$4,011,609. For the same period in 1905-6 the exports were 34,847,354 pounds, valued at \$7,192,450. Owing to the high prices that prevailed for cheese, there was a decreased production of butter, which accounts for the reduction in the exports. A feature of the export trade during the year 1906-7 was the considerable quantity of Canadian dairy butter which was re-shipped from

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England to Canada during the fall and winter months, and obviously sold here at a profit after paying all charges both ways. The product of the best Canadian creameries gave splendid satisfaction in the old country markets, but as much cannot be said for the bulk of the butter exported. Mould was complained of to some extent, as well as the excessive use of salt. Many shippers did not sack their boxes, with the result that the packages very often presented a soiled appearance, and some butter-makers continued the use of cheap inferior parchment to the great detriment of their product. These are a few of the handicaps that our export butter trade suffered from last season. In London the average price for Canadian creamery butter for the six months ending November 30; was 109 s., as compared with 105 s. the year before. In the Bristol market for the same period the price averaged about 114 s., as compared with 112 s. in 1905. The total quantity of butter imported into the United Kingdom for the year ended March 31, 1907, was valued at \$113,027,296, of which Canada supplied \$3,805,925 worth.

Our Liverpool inspector in his annual report covering the season of 1906 makes the following reference to butter shipments:—

‘There has been a great falling off in shipments of butter to this port this season, but I have noticed more boxes than ever coming without sacking. This is a great mistake on the part of the butter shippers, for I am certain that if they could only see the difference in appearance between covered and uncovered packages on landing here, they would not ship another box without a cover. The steamship companies have done good work in carrying butter this season, landing it here in perfect condition.’

Our Glasgow inspector's reports show that the shipments of Canadian butter have been landed at that port in good condition, with the exception of one consignment shipped in August in ordinary storage and which, naturally, arrived in a very soft condition and off in flavour. Some of this butter rapidly developed mould, causing the importers considerable trouble and creating a bad impression generally. This instance shows the folly of shipping butter across the Atlantic during the summer season in anything but cold storage.

At the close of the Montreal shipping season our Glasgow inspector commented as follows *re* the bagging of butter packages:—

‘The majority of the packages imported were bagged and the advisability of this system cannot be too strongly advocated for Glasgow when one observes boxes of butter in close proximity to a space in the shed into which grain is being discharged from the steamer by elevator with all the attendant dust. The bags make a much more attractive and cleanly package when stripped and also serve as a protection in the event of breakage. One lot of boxes coming under my notice this year was without bags, and as the covers were badly fitted, many of them were broken during unloading and discharging, the butter as a result being exposed.’

THE EXPORT CHEESE TRADE.

The exports of cheese for the year ended March 31, 1907, amounted to 178,141,567 pounds, valued at \$22,006,584. Exceptional prices prevailed throughout the entire season, which must have been a very satisfactory one for dairymen. According to the figures compiled by the *Montreal Gazette*, the price of cheese in Canada for the season of production would average 11½ cents per pound, the highest on record. There was a very strong demand in Great Britain, due to greatly increased consumption, in some quarters the increase being estimated at 25,000 boxes per week. In London the price of Canadian cheese for the seven months ended November 30, averaged 5s. 6d. per hundred-weight higher than for the previous year.

Very little improvement was shown in the condition of the boxes on arrival at the ports in Great Britain last season, and the usual complaints were received regarding the indistinct branding of many of the boxes. The following extracts from the annual report of our Liverpool cargo inspector refer to these two points:—

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‘The imports of cheese have been fully up to the shipments of the last two seasons as regards quality, but there has been little, if any, improvement in the quality or condition of the boxes. There is a lot of cheese landing here in very rough condition, owing chiefly to the poor condition of the boxes. There have been two or three new materials tried for making boxes, such as tin and very thick cardboard, but these are not so satisfactory as wood. The cheese from the government cool curing rooms have again been in excellent condition, and if this quality of box became universal there would be very little to complain of *re* broken boxes. The patent stitched boxes have also been in excellent condition, and this is a very good idea for saving breakages. It has been suggested to me by two of the master stevedores of the leading shipping companies, that, if the cheese were put up in boxes not exceeding 65 pounds weight there would be considerably less breakage. They say that men unloading cheese from a ship will not lift cheese of 80 pounds weight that are stowed ten or twelve high, but will pull out one of the bottom boxes in the tier and allow the cheese above to fall on the deck, thus breaking many boxes. They say that if the cheese were 60 to 65 pounds the men would lift these cheese down right from the top tier and save a lot of breakage that occurs in letting them fall.

‘I have noticed a few lots of cheese this season that have been badly branded. By this I mean that the shipping mark has been very indistinct. This also applies to factory marks, even in a more marked degree, as many of these are so blurred as to be indistinguishable. There is a lot of cheese coming without any factory marks, and I think it would be a good idea if all cheese makers were compelled to put the factory mark on their boxes.’

It is very gratifying to note that the fine reputation possessed by Canadian cheese in the markets of Great Britain was not only maintained last season, but was enhanced. Importers generally were well pleased with the quality and condition, and the following complimentary reference appeared in the annual review of Messrs. Weddel & Co., of London, who are large importers of colonial dairy produce:—

‘The quality of Canadian cheese last year not only fully maintained its former reputation, but on the whole it was improved. The Canadian cheesemaker, like the Danish buttermaker, has become so proficient in his art that it is seldom necessary to unfavourably criticise his work. Wherever an inferior quality is produced in Canada it is more generally found to be due to want of suitable surroundings or to the uneconomical methods and customs of some factory, together with defective transit, rather than to the lack of art in the cheesemaker. The improvement in the conditions of transit and in the shipment to this country and discharge at our ports, which has taken place during the last year or two, has resulted in Canadian cheese arriving on our markets in a much better condition than it did formerly. The weak spots in the Canadian cheese industry lie in the terms of engagement usually made with the managers of the factories, and the practice of factories generally allowing their produce to come to this country without any indication on the boxes as to the factory where it was manufactured, makers thereby losing the advantages to be derived by advertising a good article.’

Under the heading ‘Shipping Arrangements,’ the following statement appears in the *Review*:—

‘The greatest advance, however, in shipping arrangements has been effected in the Canadian trade by the establishment of cold stores for butter, and cold rooms for cheese at the Surrey Commercial docks in London. The plant, discharging arrangements, proximity of the vessels to stores, and everything in connection with the new venture are so far superior to the antiquated accommodation previously afforded at Tilbury and the Commercial Road stores, that the great bulk of the Canadian cheese trade has gone to the Surrey Commercial docks. The improvement in accommodation and storage has been of immense benefit to everyone dealing in Canadian cheese.’

The only serious criticism heard last season from British importers had reference to the pernicious practice of shipping Canadian cheese in a green condition, which was

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followed to such an extent in 1906. On account of market conditions cheese were rushed from the factory within a few days from the time they were taken from the hoops, and, in this immature condition, were shipped to the old country. If the factorymen persist in following this course they will assuredly kill the goose that lays the golden egg, and have no one but themselves to blame for it.

CHEESE IMPORTS INTO THE UNITED KINGDOM.

In the following table is shown the quantity of cheese imported into the United Kingdom during the past seven years, and the percentage supplied by different countries:—

FROM BRITISH TRADE RETURNS, YEARS ENDED DECEMBER 31.

From.	1900.	1901.	1902.	1903.	1904.	1905.	1906.
	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.
Canada	1,511,872	1,547,739	1,709,565	1,848,142	1,900,556	1,858,767	1,925,835
United States.....	680,583	540,102	390,479	360,916	224,830	175,256	233,425
Holland	327,382	315,923	284,020	362,503	233,601	214,033	224,343
New Zealand	77,617	79,094	51,875	50,239	84,947	78,626	126,216
Other Countries.....	108,424	103,979	110,273	126,458	110,368	116,600	123,957
Total.....	2,705,878	2,586,837	2,546,212	2,694,358	2,554,297	2,442,682	2,638,776
	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Canada.....	55.8	59.8	67.2	68.6	74.4	76.1	73.0
United States.....	25.1	20.9	15.3	13.4	8.8	7.2	8.8
Holland	12.0	12.3	11.2	11.2	9.1	8.7	8.7
New Zealand	2.9	3.0	2.0	2.1	3.3	3.2	4.8
Other Countries.....	4.2	4.0	4.3	4.7	4.4	4.8	4.7
Total.....	100.	100.	100.	100.	100.	100.	100.

THE EXPORT FRUIT TRADE.

The enterprise of Canadian apple shippers, and perhaps the excellent quality of the Canadian apple, are demonstrated by the fact that Canadian apples are now being shipped to 21 different countries, as follows:—

Great Britain, Germany, France, United States, Newfoundland, South Africa, Holland, Bermuda, Denmark, Cuba, Mexico, St. Pierre, Australia, Norway, British West Indies, Belgium, New Zealand, British Guiana, Fiji, China and Hong Kong.

Of these, Great Britain, Germany, France and the United States are our largest customers, but relatively we are sending a fair quantity of apples to Newfoundland, South Africa, Holland and Bermuda.

It would seem desirable to push the sale of Canadian apples over as wide an area as possible. In a product that depends so much on the local supply in the various countries to which we export, there is a very great advantage in having commercial connections in many different countries. The sale of apples abroad does not depend altogether upon the quality of the fruit, or even upon the means of transportation. Much depends upon mutual confidence between the buyer and seller, but much depends also upon gaining the confidence of the consumers, and this can only be done by giving them an opportunity to sample the goods and thus determine their good qualities by actual test. Under these circumstances, it is very desirable that as many as possible of these 21 markets should receive some shipments every year so that close commercial relations may be maintained and the reputation of our fruit kept constantly before as many customers as possible. If one market is somewhat overstocked we will thus have an easy introduction into another.

IMPROVED TRANSPORTATION FACILITIES FOR FRUIT.

In July last the Dairy Commissioner issued a circular to fruit shippers stating that, by virtue of an agreement made with this department, the Grand Trunk and Canadian Pacific Railway Companies would supply, from August 1 to September 30, iced cars for the carriage of carloads of fruit to Montreal or Quebec, for export; the cars to be furnished by the railway companies on request of the shippers, and the department to pay icing charges to the extent of \$5 per car. This service was duly put into operation and one hundred and two carloads of fruit, largely early apples, were shipped during the period named.

In order to get some information regarding this special service, a form was prepared by this division, and a supply mailed to a large number of apple shippers. A number of addressed envelopes were inclosed, and the shipper was requested to fill out one form for each car shipped and mail same to our Montreal office not later than the day of shipment. Unfortunately, as only five shippers took the trouble to fill in and forward this form, we did not derive much information from it. To the five shippers in question, namely, The Forest Fruit Growers' Association, Forest, Ont., M. J. Gillard, Grafton, Ont.; Chas. A. Watts, Thamesville, Ont.; F. A. Sweetman, Trenton, Ont., and John Brown, Brighton, Ont., our thanks are due for their courtesy in complying with our request. The following is a copy of the form referred to:—

Department of Agriculture,

Dairy Commissioner's Branch.

Special Iced Car Service for Export Fruit.

Kindly fill out and mail this form in the inclosed envelope not later than day of shipment.

Mémo. *re* Shipment of Export Fruit.

.....190....

I have shipped to-day from..... station barrels of apples in
..... iced car No..... for export via the.....
Railway to Montreal, thence by the..... SS. line to.....
(Port of destination.)
.....
(Shipper.)

.....

If the shipper will furnish the following additional details it will facilitate the efforts of the department to locate and remedy any defects in the service that may exist.

1. Were the car doors tight, and was the car generally in good condition?
.....
2. Was the car well iced when loaded (state whether bunkers were full of ice, two-thirds full, or one-third full)?
.....
3. Were the apples loaded direct from the orchard or from a storehouse?
.....
4. What was the temperature on day of loading: (a) of the apples in the barrels
.....(b) outside in shade at mid-day.....

NOTE.—These temperatures would be helpful to the Department, but if they cannot be obtained without delaying the report, omit them.

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Report by Montreal Inspector.

Car No..... arrived..... unloaded.....
Condition of car.....
Temperatures of fruit inside packages.....
Shade temperature outside.....
Remarks

HEATED APPLES AT MONTREAL.

A considerable proportion of the early apples shipped to Montreal for export during August, September and the early part of October reached that port in a heated condition. As they were picked and packed in hot weather, and in the majority of cases shipped in an ordinary box car, it is not to be wondered at that many lots showed signs of decay when they were unloaded from the cars at Montreal. To illustrate the condition of many of these shipments of early apples when they reached Montreal, I will quote the fruit inspector's report on the condition of the apples loaded in the SS. *Ionian*, which sailed for Liverpool on September 21.

Date of Inspection.	TEMPERATURE.		Condition of Apples.
	In Dock Shed.	Of Fruit.	
	Degrees.	Degrees.	
September 19	76	66	Good.
" 19	64	70	"
" 21	64	68	"
" 21	64	66	"
" 21	72	70	"
" 21	78	72	Heated.
" 21	78	70	Good.
" 21	64	80	Poor condition, heated.
" 21	66	76	"
" 21	66	75	"
" 21	66	76	Heated.
" 21	66	72	Good.
" 21	66	70	"
" 21	66	70	"
" 21	75	78	Heated.
" 21	68	78	"
" 21	66	64	Good.
" 21	66	76	Heated.

SHIPMENTS OF CANADIAN PEARS.

A feature of the export fruit trade last season was the number of shipments of Canadian pears to Great Britain. According to our inspectors' reports these shipments were distributed as follows: Glasgow, 14 shipments, 2,846 cases; London, 4 shipments, 587 cases and 161 barrels; Liverpool, 8 shipments, 793 cases and 11 barrels; Manchester, 2 shipments, 174 cases. These pears were all landed in good condition with the exception of one shipment in October and one in November, which were carried in ordinary storage and were discharged in bad order. The October shipment was billed as 'apples,' and was not inspected at Montreal, but the November shipment was examined by the fruit inspector, and reported in 'soft' condition. The Biggs Fruit & Produce Co., Ltd., of Burlington, Ont., made regular shipments to Glasgow and Liverpool, of Bartlett pears, packed in twenty-pound boxes, and each consignment was landed in good condition. These pears were carried by express from

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Burlington to Montreal, and in cold storage from Montreal to port of destination. The quality of these pears was much appreciated in Great Britain, and they realized good prices.

INSPECTION OF ICED CAR SERVICES FOR BUTTER, SEASON 1906.

The special iced car service for butter operated by the different railway companies under an arrangement with this branch of the Department of Agriculture was commenced on May 7 and closed on October 21, cars being operated over sixty-one different routes. This was a considerable extension in the service compared with 1905, when the number of routes was fifty-one. Five inspectors were employed during the season, as follows: two at Montreal, two travelling over the iced car routes in Quebec and one over the routes in Ontario. The duties of the inspectors were to report the conditions under which the butter was hauled from the creameries to the railway stations, the temperature of the butter when loaded into the cars, the condition in which they found the cars, and whether they were well iced or not. The inspectors at Montreal examined the butter arriving in the iced cars and reported the temperature and condition of the butter, the condition of the cars, quantity of ice remaining in the bunkers, &c. They paid particular attention to the packages that had been tested and marked at the shipping points by the travelling inspectors, making a note of the temperatures as soon as these packages were unloaded from the cars.

BUTTER TEMPERATURES AT RAILWAY SHIPPING POINTS.

During the season the inspector travelling on the Grand Trunk Railway and Canadian Pacific Railway, and connecting lines, in the eastern townships, made three or more tests of butter shipped from 95 creameries, the average results of which are shown in the following table:—

AVERAGE TEMPERATURES OF BUTTER AT QUEBEC RAILWAY SHIPPING POINTS, SEASON 1906.

Creamery.	Location.	Line.	Number of packages tested.	Average temperature.
				Degrees.
Lawrenceville B 2	Lawrenceville.	O. M. & C. P. R.	4	38.0
Shipton.	Danville.	G. T. R.	7	40.1
Compton.	Compton.	"	3	42.6
W. W. Reed.	North Hatley.	B. & M. & C. P. R.	14	43.2
Hatley Centre.	"	"	13	43.7
Crown.	Iron Hill.	C. P. R.	25	43.9
Kingsey.	Kingsey	G. T. R.	11	44.1
Silver Lake.	Eastman.	O. M. & C. P. R.	13	44.1
Daisy A.	Kingscroft.	B. & M. & C. P. R.	14	44.2
B 12.	St. Pie.	C. P. R.	4	44.2
Lawrenceville B 9.	Lawrenceville.	O. M. & C. P. R.	4	44.2
Warden Reg. No. 2.	Warden	C. P. R.	6	44.3
Ladd's Mills.	Ladd's Mills.	G. T. R.	9	44.4
Kensington.	Kensington.	"	8	44.7
Way's Mills.	Wayville.	B. & M. & C. P. R.	9	44.9
St. Francis.	Richmond.	G. T. R.	11	44.9
Silver Star.	Bedford	C. P. R.	12	45.2
Dale 17.	St. Herménégilde.	G. T. R.	13	45.3
St. Francis F. & M.	"	C. P. R.	4	45.5
Dunham T 35.	Dunham.	"	16	46.5
G. A.	Sherbrooke.	G. T. R.	5	46.6
B 25.	N. Dame de Stanbridge.	C. P. R.	10	47.0

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AVERAGE TEMPERATURES OF BUTTER—*Continued.*

Creamery.	Location.	Line.	Number of packages tested.	Average temper- ature. Degrees.
Rose H.	St. Elwidge.	G. T. R.	12	47.1
Franklin Centre.	Franklin.	"	17	47.2
Rang Double.	"	C. P. R.	4	47.2
St. Dominique B 2.	St. Dominique	G. T. R.	4	47.2
Kelso.	Kelso.	"	3	47.3
Sawyerville.	Sawyerville	C. P. R.	35	47.3
West Shefford.	West Shefford.	"	34	47.7
Ash J. A. S.	"	G. T. R.	4	47.7
J. E. G.	Bromptonville	"	12	48.0
Ayer's Cliff.	Ayer's Cliff.	B. & M. & C. P. R.	14	48.0
Magog, A. C.	Magog.	C. P. R.	55	48.0
Lily Dale.	L'Ange Gardien.	"	7	48.2
Mystic Gem	Mystic	"	10	48.3
Holton.	Holton.	G. T. R.	8	48.3
Melboro J. M.	Melboro	O. M. & C. P. R.	11	48.5
Mount Oxford.	Cherry River.	C. P. R.	51	48.5
Dale I.	"	"	3	48.6
Dale 3.	Coaticook.	G. T. R.	12	48.8
76.	Bromptonville.	"	16	49.3
Maple Leaf.	Laroche.	C. P. R.	24	49.4
Barnston.	Barnston.	G. T. R.	13	49.5
Knowlton.	Knowlton	C. P. R.	12	49.8
Mountain Vale.	Eastman.	O. M. & C. P. R.	13	49.9
East Hatley 981.	East Hatley.	B. M. & C. P. R.	15	50.0
Cowansville.	Cowansville	C. P. R.	16	50.1
M. 76.	St. Pie.	"	9	50.3
D. 9.	Padine	"	3	50.3
St. Dominique A. 307	St. Dominique	G. T. R.	3	50.3
Hemmingford No. 2.	Barrington.	"	5	50.8
W. H. Stewart	Frontier.	"	16	51.0
St. Dominique B.	St. Dominique.	C. P. R.	3	51.0
J. A. M.	Brosseau	G. T. R.	4	51.0
Rose Bud	Racine.	O. M. & C. P. R.	8	51.1
Green Valley.	Mansonville.	C. P. R.	25	51.2
Vale Perkins	Vale Perkins	"	22	51.2
St. Etienne H. 211.	St. Etienne.	"	58	51.2
Elm Bank.	Abbotsford.	"	5	51.4
Fitch Bay	Fitch Bay.	B. & M. & C. P. R.	9	51.5
Warden No. 21.	Warden.	C. P. R.	9	51.5
Katevale T. 66.	Katevale.	"	59	51.8
Olive Factory	L'Ange Gardien.	"	4	52.0
Lilac.	Abbotsford	"	4	52.0
Canadian.	St. Edward	G. T. R.	9	52.4
Sherrington No. 1.	Sherrington.	"	13	52.6
Napierville No. 2.	Napierville	"	12	52.7
Ivy.	L'Ange Gardien	C. P. R.	7	52.8
Douglasburg No. 1.	Douglasburg	G. T. R.	8	52.8
Wickham.	Wickham.	C. P. R.	11	52.9
St. Isidore.	St. Isidore.	G. T. R.	12	53.0
St. Dominique R. 29	St. Dominique	C. P. R.	5	53.2
F. & S.	Hemmingford.	G. T. R.	16	53.5
Yamaska	Yamaska	C. P. R.	6	53.5
F. & M. 57.	St. Pie.	"	11	53.6
St. Hugues R. 200.	St. Hugues.	"	13	53.6
St. Simon N.D.	St. Simon.	"	7	53.7
12M.	"	"	"	"
R	St. Valerien	"	8	53.8
105	"	"	"	"
St. Dominique $\frac{H}{B}$ 28	St. Dominique	"	4	54.0
Hemmingford	Hemmingford.	G. T. R.	4	54.2
Purdy's.	South Stukley.	C. P. R.	47	54.3
Hillcrest 1 Canada	St. Hugues.	"	1	55.0
St. Simon N. T. $\frac{594}{M}$	St. Simon.	"	4	55.0

AVERAGE TEMPERATURES OF BUTTER—Continued.

Creamery.	Location.	Line.	Number of packages tested.	Average temperature.
				Degrees.
Hillcrest.....	St. Théodor.....	G.T.R.....	3	55·3
Winslow No. 1.....	Winslow.....	C.P.R.....	3	55·3
Canadian R. P. Produce.....	St. Rémi.....	G.T.R.....	8	55·6
Maple Brand.....	".....	".....	4	55·7
Rockside 8.....	".....	C.P.R.....	9	55·9
689 G.....	Scottstown.....	".....	3	56·0
Beranger.....	Beranger.....	".....	4	56·5
W. H.....	Huntingdon.....	G.T.R.....	3	56·6
7th Range.....	Acton.....	".....	3	57·3
I 53.....	".....	".....	3	58·0
J. A. V.....	St. Michel.....	".....	3	58·6
F 62.....	White River.....	".....	3	61·0

The inspector travelling on the North Shore line of the Canadian Pacific Railway, on the Intercolonial, Quebec Southern and Great Northern railways, made three or more tests of butter shipped from 78 creameries, as follows:—

AVERAGE TEMPERATURES OF BUTTER AT QUEBEC RAILWAY SHIPPING POINTS
SEASON 1906.

Creamery.	Location.	Line.	Number of packages tested.	Average temperature.
				Degrees.
Préfontaine & Frère.....	Isle Verte.....	I.C.R.....	4	42·2
F. & P. Cyr.....	Lepage.....	C.P.R.....	6	45·0
M. Grenon.....	St. Barnabé.....	Q.S.R.....	3	45·6
G. Langlois.....	Rivière du Loup.....	I.C.R.....	3	47·3
Société Côte des Erables.....	Isle Verte.....	".....	3	47·6
Dandonneau & Mondor.....	St. Damien.....	C.P.R.....	3	48·0
J. Beaulieu.....	St. Flavie.....	I.C.R.....	3	48·6
F. & P. Cyr.....	Bruchés.....	C.P.R.....	6	49·0
M. Beaulieu.....	St. Paul.....	I.C.R.....	3	49·0
St. Barnabé Creamery.....	St. Barnabé.....	Q.S.R.....	5	49·0
Ant. Alarie.....	St. Jérôme.....	G.N.R.....	5	49·6
W. Gareau.....	St. Jérôme Crossing.....	".....	3	50·0
J. A. Sandon.....	St. Arsène.....	I.C.R.....	3	50·3
Pierre Brault.....	St. Sébastien.....	Q.S.R.....	3	50·6
M. Dupré.....	St. Louis.....	".....	3	51·3
M. Houle.....	St. Jude.....	".....	3	51·6
Louis Lussier.....	Rougemont.....	".....	3	51·6
E. H. Morin.....	Henryville.....	Q.S.R.....	4	52·0
A. Breton.....	St. Épiphanie.....	I.C.R.....	3	52·0
H. Lafrance.....	Grand Frenière.....	C.P.R.....	3	52·3
H. Lafrance.....	St. Joseph.....	".....	6	52·8
O. Bernier.....	St. Lin.....	".....	3	53·0
Pierre Langlois.....	St. Angele.....	I.C.R.....	3	53·3
P. Plante.....	St. Joseph.....	C.P.R.....	3	53·6
3rd Range.....	Isle Verte.....	I.C.R.....	3	53·6
T. St. Georges.....	St. Paul.....	G.N.R.....	3	53·6
O. Cardinal.....	St. Roch.....	C.P.R.....	6	54·0
J. A. Roy.....	St. Jean de Matha.....	".....	3	54·0
S. Comtois.....	St. Janvier.....	".....	3	54·0
O. Briere.....	Mont Carmel.....	".....	4	54·0
J. S. Parthenais.....	Vaocluse.....	".....	3	54·3

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AVERAGE TEMPERATURES OF BUTTER—*Continued.*

Creamery.	Location.	Line.	Number of packages tested.	Average temperature.
				Degrees.
J. E. Thériault.....	St. Modeste.....	I.C.R.....	3	54.6
J. M. St. Pierre.....	St. Flavie.....	".....	3	54.6
C. Guitard.....	St. Joseph.....	C.P.R.....	12	54.6
E. Dumas.....	St. Epiphane.....	I.C.R.....	3	55.3
J. O. Naud.....	St. Bazile.....	C.P.R.....	6	55.5
Ludger Lamothe.....	Clarenceville.....	Q.S.R.....	4	55.5
Fortin & Marceau.....	Stottsville.....	G.T.R.....	3	55.6
Riverside Creamery.....	St. Bazile.....	C.P.R.....	10	55.8
M. E. Tremblay.....	Clarenceville.....	Q.S.R.....	4	56.0
G. Lanthier.....	St. Augustin.....	C.P.R.....	9	56.4
M. Laporte.....	St. Ambroise.....	I.C.R.....	3	56.6
Alb. Morrisette.....	St. Mélanie.....	".....	3	56.6
Vézina & Mathe.....	Cap Santé.....	C.P.R.....	3	57.0
Geo. Bélanger.....	St. Antoine.....	I.C.R.....	3	57.0
J. O. Naud.....	Portneuf.....	C.P.R.....	6	57.1
Wilf. Ferron.....	St. Léon.....	".....	3	57.3
Comtois & Mondor.....	St. Thomas.....	".....	3	57.3
J. E. Binette.....	St. Eustache.....	".....	9	58.3
M. Meunier.....	Henryville.....	Q.S.R.....	3	58.6
A. Rainville.....	St. Gabriel.....	C.P.R.....	3	58.6
E. Dion.....	St. Thomas.....	".....	3	59.0
Syndicat St. Paul.....	Isle aux Noix.....	G.T.R.....	4	59.2
G. Marion.....	Isle Janvier.....	C.P.R.....	3	59.3
Donat Ferron.....	St. Paulin.....	G.N.R.....	3	59.3
F. Lapointe.....	St. Maurice.....	C.P.R.....	4	59.5
Eug. Boucher.....	Cast Hill.....	".....	3	59.6
M. Boucher.....	Joliette.....	".....	3	60.0
X. Brault.....	St. Felix.....	".....	3	60.3
J. Kimpton.....	Shawbridge.....	".....	3	60.3
Jos. Fleury.....	St. Léon.....	".....	3	60.6
D. T. Brunet.....	Chicot.....	".....	6	61.0
O. Roberge.....	St. Félix.....	".....	3	61.3
Hardy & Frère.....	St. Bazile.....	".....	7	61.8
E. Brosseau.....	St. Adèle.....	".....	3	62.3
O. Gareau.....	St. Jean de Matha.....	".....	3	63.3
F. & Marceau.....	Napierville.....	G.T.R.....	4	63.7
J. Lafrance.....	St. Eustache.....	C.P.R.....	3	64.0
E. Brosseau.....	St. Marguerite.....	".....	3	64.6
H. Constantin.....	St. Alexis des Monts.....	G.N.R.....	3	64.6
Jos. Shaw.....	Morin Flats.....	C.P.R.....	3	65.0
H. Bergeron.....	St. Paulin.....	G.N.R.....	3	66.3
P. Allard.....	St. Alexis des Monts.....	".....	3	66.3
Ed. Brosseau.....	St. Sauveur.....	C.P.R.....	3	67.0
Esdras Bellemare.....	Maskinonge.....	".....	3	67.3
Luc Bellemare.....	St. Barnabé.....	G.N.R.....	3	67.6
O. Gelinas.....	".....	".....	3	67.6
A. Milot.....	Louisville.....	C.P.R.....	3	68.0

The inspector travelling in Ontario made three or more tests of butter from 28 creameries, and also three or more tests of 22 different lots of dairy butter. The average temperatures of the creamery butter and the dairy butter at the shipping points were as follows:—

AVERAGE TEMPERATURES OF CREAMERY AND DAIRY BUTTER AT ONTARIO SHIPPING POINTS, SEASON 1906.

Creamery Butter.	Number of Packages Tested.	Temperature.	Dairy Butter.	Number of Packages Tested.	Temperature.
		Degrees.			Degrees.
Lindsay V.R.	3	32·0	Centralia (F. & G.).....	4	53·0
Fergus	5	40·0	Bowmanville.....	4	57·2
Princeton.....	3	40·0	Blyth (L.).....	4	57·7
Dundalk.....	5	42·0	Ripley (A.)	3	58·0
Dungannon.....	5	42·9	Dundalk (R.)....	3	58·6
Neustadt.....	5	44·0	Shelburne.. . . .	4	59·2
Brussels	5	46·9	Newton.....	4	60·5
Underwood.	3	50·0	Mount Forest.....	3	61·3
Exeter (J. & C.).....	3	50·0	C. W. Riley (Clinton).....	10	61·8
Parker.....	3	50·6	Seaforth A. D. 55	4	65·0
Exeter (W.).....	3	51·3	Parsons, Davis & Co. (Centre-		
Holmesville.....	18	51·9	ville).....	6	66·0
Peterboro	4	52·0	Berlin.....	9	66·0
Eldon.....	4	52·0	Ayr (R.).....	4	68·0
Exeter (Ayrshire Road)....	4	52·0	Grand Valley.....	3	68·0
Holmesville 109.....	7	52·2	Sebringville.....	4	68·3
Clinton.....	4	53·0	J. W. Skinner (Park Hill)....	5	69·4
Warton L. S.....	4	53·7	W. Packard, Seaforth	3	70·0
Petersburg.....	6	53·8	J. W. Skinner, Ailsa Craig..	5	70·8
Exeter 55	14	54·2	Geo. Powell, Seaforth.....	3	71·3
Paisley.	6	55·0	Centralia (W.).....	4	72·0
Orangeville (76)	4	56·0	Hensall (A.)	4	72·5
Baden.....	12	56·4	Tilbury (F.M.).....	4	74·0
St. Dominique.....	7	56·8			
Lucan (X)	4	58·0			
Cedars	3	60·0			
Seaforth (A. P.).....	5	61·6			

NOTE.—In some cases the name of the creamery is given, in others the name of the railway shipping station.

As already stated, special marks were placed by the travelling inspectors on a few of the packages of butter tested by them at the different stations, and these packages were watched for and again tested at Montreal, in order to ascertain if the butter had become warmer or cooler during the journey. These tests have been carefully calculated and the average temperatures worked out as shown in the following table:—

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AVERAGE temperatures of 1,173 marked packages of butter tested at railway stations in the provinces of Ontario and Quebec, and the average temperatures of these same packages when unloaded from refrigerator cars at Montreal.

SEASON OF 1903.

	Number of cars carrying marked packages.	Number of marked packages tested at shipping points and at Montreal.	Average temperature at shipping points.	Average temperature at Montreal.	Increase in temperature.	Reduction in temperature.
			Degrees	Degrees.	Degrees.	Degrees.
Ontario via. C.P.R.....	3	21	57.7	53.7	.....	4.0
" G.T.R.....	14	103	53.9	53.4	.....	3.5
Quebec (North of St. Lawrence) via. C.P.R.....	14	179	58.5	56.5	.....	2.0
Quebec (South of St. Lawrence) via. C.P.R.....	48	651	50.6	52.4	1.8	.....
Quebec via. G.T.R.....	20	145	51.2	52.7	1.5	.....
" I.C.R.....	3	43	51.1	54.5	3.4	.....
" Q.S.R.	3	24	51.2	49.2	.....	2.0
" G.N.R.....	1	4	66.0	61.0	.....	5.0
Totals	106	1,173				
General Average.....			52.6	53.2	0.6	.....

In the whole season the two inspectors stationed at Montreal inspected and reported upon 1,256 cars, giving the number of packages of butter in each car, the weight of the packages, number of packages tested and the temperature of each. A summary of their work is given in the following table:—

MONTREAL INSPECTION OF REFRIGERATOR CARS CONTAINING BUTTER,
SEASON OF 1906.

	Number of Cars Examined.	Number of Packages in Car.	Weight of Packages.	Number of Packages Tested.	Average Temperature.
			lbs.		Degrees.
C. P. R.....	501	155,956	9,845,644	1,620	53
G. T. R.	375	110,575	7,022,343	1,187	55
I. C. R.....	109	43,413	2,892,058	344	55
Q. S. R.....	35	7,032	444,143	122	54
O. C. R.....	34	10,423	680,888	122	52
G. N. R.	95	19,471	1,272,724	367	56
C. V. R.....	107	21,680	1,470,055	247	57
Totals....	1,256	468,550	23,627,860	4,009	

In order to give a better idea of the refrigerator car services operated under the Department's guarantee during the season of 1906, I shall make a brief reference to the service maintained by each railway.

Canadian Pacific Railway.—On the C. P. R. the icing was better attended to in the season of 1906 than heretofore, and, judging from the inspectors' reports, it looks as though there had been some improvement in several of the creameries shipping butter by this line; but this improvement was in the best section and amongst the best creameries. As shown in the above table, 1,620 packages of butter were tested in the freight sheds at Montreal, and the average temperature was 53 degrees. The

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Quebec butter, which comprised four-fifths of the whole quantity carried, was under 53 degrees, while the butter from western Ontario was about 56 degrees, but the proportion of the latter was so small that 53 degrees remained the average. The C. P. R. cars carried an average load of 311 packages of butter, and 670 pounds was the average estimated quantity of ice per car when unloaded at Montreal. A noticeable improvement was shown in the service between Quebec and Montreal, and on the whole, the iced car service over this road may be said to have shown some improvement over the previous year.

Grand Trunk Railway.—On account of the necessity for amalgamating, at junction points, the butter collected by the cars running on the numerous branch lines, it is a very difficult matter to arrange the G. T. R. western iced car services so that satisfactory results will be obtained. Another handicap is the large quantity of dairy butter carried in these western cars. As this butter is usually very warm when loaded, it raises the temperature of the creamery butter carried with it; and as the packages are of different shapes and sizes, it is difficult to stow them properly, so that when the car reaches Montreal it is not uncommon to find several broken and their contents distributed over the other packages, which, of course, does not improve the appearance of the latter. In 1906, after our travelling inspector commenced his work, the cars from western Ontario were much better iced than in any previous year. Taking the whole service over the G. T. R., the proportion of butter from western Ontario was about one-third, with an average temperature at Montreal of 57 degrees. The remaining two-thirds comprised butter shipped from Quebec points, with an average temperature of not quite 54 degrees. The average load per car was 295 packages and 611 pounds was the average estimated amount of ice per car on arrival at Montreal. Speaking generally, the G. T. R. service in 1906 did not show any marked improvement over the preceding year, with the exception of the better icing and more careful loading on the western service referred to above.

Intercolonial Railway.—The I. C. R. put on a greatly improved iced car service for butter last season, as new cars were put into commission and the icing was much heavier than in former years. In order to show the betterment in this service I quote the following report received in June last from Mr. M. B. Longeway, our iced car inspector at Montreal:—

‘MONTREAL, June 7, 1906.

‘Mr. W. W. Moore,
‘Chief, Markets Division,
‘Ottawa.

‘*I. C. R. Iced Car Service for Butter.*

‘DEAR SIR,—I take pleasure in informing you that the I. C. R. are operating this season a greatly improved and very fine service for the transportation of butter.

‘You will doubtless remember the many objections I have made during the last two or three seasons, the poor cars in use, the smallness of their ice compartments, the lack of circulation, caused by what I considered faulty construction of the ice bunkers, the battered condition of the hatches, and lastly the poor icing. Usually the icing was light, and in the case of cars having four ice bunkers, only those in diagonal positions in the car were filled. This has all been changed this season. New cars have been constructed and, so far, these are the only ones in use in the special butter service. These cars are up-to-date and finely constructed, and all things considered, I believe them equal to, if not better than, the best refrigerator cars in use to-day. In these new cars the I. C. R. have adopted the Bohn system of refrigeration, retaining, however, the wired side space at top of the sides of car for the promotion of circulation, which was a commendable feature of their best cars of past years. The ice bunker capacity is larger, about 4 tons per car, with only one compartment at each end extending entirely across the car. The floors are dunnaged, with strips running across the car instead of lengthwise, and at first the freight handlers objected strenuously

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to this on account of the difficulty in unloading, but I think they have partially overcome the difficulty by keeping boards in the sheds, which they place between the dunnage as they unload. The circulation of cold air is fine, and butter near the centre of the car receives much more benefit from the ice than in the old cars. So far this season these cars have been heavily iced, and if they keep up the quantity of ice that they are using now, you may confidently expect to see the I. C. R. the banner road—as regards temperatures—when the season's work is analyzed.

‘I am looking forward with interest to the time when Mr. Bouchard, travelling inspector, visits the creameries and stations along the I.C.R. The lots of butter are small and I do not think that the little creameries make as much effort to cool their butter as is made by the creameries in the townships, but, the boxes are clean, the butter is good and, so far, the temperatures low, and a little effort all around ought to put that section equal to the best. Of course, I am writing of their butter as a class.

‘Yours truly,

· (Sgd) M. B. LONGEWAY,

‘Iced Car Inspector, Montreal.

‘P.S.—I might say that the Quebec Southern car from Noyan is furnished by the I.C.R., and the Quebec Central is also using one of these new cars.

‘M. B. L.’

Three hundred and forty-four packages, ex. I.C.R. cars, were tested at Montreal and gave an average temperature of 55 degrees. It will be noted that this is a higher temperature than shown by some of the other roads, but unfortunately the supply of ice on the I.C.R. became exhausted about the middle of September and, as the weather was unusually warm from that time until the close of the service on October 21, the butter was delivered from the cars in a warmer condition than usual and the average for the whole season considerably raised. In spite of the fact that no icing was done after the 15th September, the average quantity of ice per car for the whole season was 1,117 pounds, the highest of any of the lines. These cars were, as a rule, heavily loaded, averaging 398 packages per car for the season.

Quebec Southern Railway.—There was some improvement in the service on the Q. S. R. One of the new refrigerator cars built by the I. C. R. was used on this road, and the icing, as a rule, was well attended to. Thirty-five cars were inspected, fifteen at Bonaventure station and twenty at Place Viger. The average load per car was 201 packages and the average quantity of ice on arrival at Montreal was 625 pounds.

Quebec Central Railway.—A splendid service was inaugurated on this line last season and apparently no efforts were spared to deliver the butter in good condition. In all thirty-four cars were examined, namely, twenty-one at Bonaventure station and thirteen at Place Viger. The temperatures of 122 packages were taken and the average found to be a little less than 52 degrees. The average load was 306 packages and the average quantity of ice at Montreal 650 pounds per car. The cars were new and were a decided acquisition to our refrigerator transportation facilities.

Great Northern Railway.—Judging from reports received from our inspectors, I am of the opinion that this line has the poorest refrigerator cars in the subsidized service. One of the principal defects is that most of the doors in the cars are badly fitted. The cars were not as heavily iced as they should have been, and some rather high temperatures were found. On an average the cars carried 205 packages of butter, and 412 pounds of ice was the average estimated quantity per car on arrival at Montreal.

Central Vermont Railway.—This road has never participated in the arrangement made by this Department with the different railroads for the carriage of butter to Montreal for export, but it is expected that they will do so this coming season. As this line brings a considerable quantity of butter from the townships into Montreal, the cargo inspectors at the latter point have usually examined and reported on the

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condition of these cars and their contents as well as the regular subsidized cars. In the season of 1906 the inspector reported on 107 cars from the C. V. R., which contained an average load of 202 packages of butter per car and an estimated average of 142 pounds of ice per car on arrival at Montreal. Many of the cars contained a mixed freight consisting of both butter and cheese. With the exception of a few New York Despatch refrigerator cars, most of the butter over this line was carried in ordinary freight cars which had been fitted with a double door and ice bunkers at each end. Some attempt had also been made at insulation, but with poor results, and as a consequence the ice in these cars melted very rapidly. Apparently the creameries served by this road deliver their butter to the cars in good condition, and if up-to-date refrigerators were in use this line would undoubtedly make a splendid showing as regards the temperature of the butter on arrival at Montreal.

THE SERVICE IN GENERAL.

At the close of the iced car service in October last the situation might be summed up about as follows: Decided improvement in cars on the Intercolonial and Quebec Central Railways; general improvement in the Quebec Southern Railway service; better icing during hot weather on the Intercolonial and on some of the Canadian Pacific Railway routes, and considerable improvement in the icing of some of the Grand Trunk Railway western cars. The most serious complaint about the iced car service made by butter shippers last season was the irregularity in the time of arrival of the iced cars. These cars are attached to way freights which are supposed to arrive at the various stations on schedule time, but which sometimes are several hours late. When this happens it means that at many of the butter shipping points served by that train, creamery and dairy butter, in large or small lots, is left for several hours on the station platform exposed to mid-summer heat. Of course, on many routes the car comes along each week right on time and the butter is loaded without delay. Under these conditions, if the butter is warm, the fault lies with the creamerymen and it must be confessed that last season, in the majority of cases, butter was delivered to the railroads at entirely too high a temperature. An instance of this was shown in the case of a shipment of butter loaded about the first of August into a Canadian Pacific Railway car at Three Rivers at a temperature of from 60 to 64 degrees and discharged from the car at Montreal at from 63 to 68 degrees. Compare the temperature of this lot of butter when loaded, with a shipment forwarded about the same time from Eastman, Quebec, the temperature of which when loaded averaged 49 degrees, and it becomes apparent at once where reform is most badly needed.

INSPECTION OF ICED CAR SERVICE FOR CHEESE.

The customary arrangement between this Department and the railway companies for the iced car service for cheese was again in force from July 2 to September 8 and, when their duties permitted, the refrigerator car inspectors at Montreal examined these cheese cars, noting the number of broken boxes, temperature of cheese, &c. Their reports covered 88 cars, in which very little heated cheese was found. Notwithstanding the exceptionally warm summer the temperature of the cheese ranged from 58 to 62 degrees, which was lower than for several years past. This was probably not altogether due to the railway service as it is likely that the improved curing rooms throughout the country were partly responsible for the cooler condition of the cheese on arrival at Montreal. About three per cent of the boxes were reported broken when unloaded from the cars, with the exception of lots from government cool curing stations, which had not over one half of one per cent of breakage. Occasionally last season a car of cheese arrived which had not been iced. This practice should be entirely discontinued, as we have found from experience that cheese shipped in un-iced refrigerator cars will arrive several degrees higher in temperature than cheese shipped in ordinary box cars. There is nothing to be gained by the use of refrigerator cars unless they are well iced before shipment.

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HAULING OF BUTTER AND CHEESE SHOULD BE DONE BY CONTRACT.

The proper plan for carrying the butter from the creamery to the railway station is to have the work contracted for by some one who will furnish a specially equipped wagon with suitable covers for the protection of the butter from the heat of the sun, rain or dust. A contractor for work of this kind would be obliged to move the butter at the proper time, and to keep his conveyance in proper order. As a matter of fact, the hauling to the station of all cheese and butter should be done by contract. The patrons of the cheese factories that sent the cheese to the cool curing rooms under contract for several years, now say that they will never haul any more cheese themselves. They find the contract system to be much more satisfactory. Farmers are often called out to haul the load of cheese or butter when the time of a man and team is worth much more to them than the cost of hiring a substitute.

DELIVERY OF PRODUCE DELAYED.

The congestion of traffic on the railways during the present year has interfered considerably with the prompt delivery of butter and cheese at Montreal. It is to be hoped that the improvements in terminal facilities, now in progress, will relieve the congestion and enable the railways to make more prompt deliveries of such perishable products.

IMPROVEMENTS NEEDED AT MONTREAL.

The carting of the butter and cheese from railroads or river boats to warehouse, and then from warehouse to ocean steamers is a very objectionable feature in the transportation of these articles. The ideal arrangement would be to have a large central cold storage warehouse on the wharfs, served by railway sidings for receipt of goods and provided with conveniences for loading direct to the steamers. Of course it would not be possible to load all steamers direct from one warehouse, but the cartage for outward shipments would be much reduced, while that on inward shipments would be almost entirely eliminated. The annual charges for the cartage of the cheese and butter would easily finance an enterprise of this kind. The cartage on cheese alone amounts to about \$59,000 per year. The saving of delay, the breakage of boxes and exposure to heat are all important considerations. In our opinion a cold storage warehouse of ample capacity located on the wharfs is quite as important to the trade of Canada as some other structures which do not appear to be very much used. It is to be hoped that before the harbour improvements are completed at Montreal, some plan of this kind may be worked out. The Commissioner has discussed it from time to time with those interested and the plan meets with general approval, but no one seems to be ready to take the initiative in the matter, and as time goes on, the difficulties of making satisfactory arrangements are increased by the erection of private cold storage warehouses in the produce district. A general scheme, which would include all vested interests, would be necessary to avoid hardship to some of the existing establishments. The advantage to the dairy trade of such an arrangement can hardly be overestimated.

ACKNOWLEDGMENTS.

In concluding this report I wish to record my appreciation of the good work performed during the year by the inspectors working under the direction of this division. In Great Britain the cargo inspection work was well looked after by Mr. A. W. Grindley and his staff, while at Montreal Mr. Wm. Macfarlane, chief cargo inspector, and Mr. M. B. Longeway, refrigerator car inspector, discharged their duties in a highly satisfactory manner.

I have the honour to be, sir,

Your obedient servant,

W. W. MOORE,
Chief, Markets Division.

PART IV.—FRUIT.

OTTAWA, March 31, 1907.

J. A. RUDDICK, Esq.,
Commissioner of Dairying and Cold Storage,
Ottawa.

SIR,—I have the honour to submit a report of the Fruit Division for the year ending March 31, 1907.

- The work of the Fruit Division for the past year includes :
- (1) The enforcement of Part IX. of the Inspection and Sale Act.
 - (2) The publication of a monthly fruit crop report.
 - (3) An inquiry with reference to the apple industry in Canada.
 - (4) Demonstrations in box packing of apples.
 - (5) Attendance and addresses at fruitgrowers' meetings.
 - (6) Assistance to fruitgrowers in other ways.

THE STAFF.

The staff consists of eight permanent and nine temporary inspectors. Occasional help in coöpering is employed on the docks during the busy export season. The inspectors are distributed with special reference to the export and interprovincial trade as follows:—

British Columbia.. . . .	1	inspector.
Alberta and Saskatchewan.. . . .	1	"
Manitoba.. . . .	1	"
Ontario and Quebec, including the ports of Montreal and Quebec.. . . .	8	"
New Brunswick, including the port of St. John.. . . .	2	"
Nova Scotia, including the port of Halifax.. . . .	3	"
Prince Edward Island.. . . .	1	"

In addition to the above Mr. M. R. Baker, B.S.A., was appointed during the year to assist me in the general oversight of the work. This was desirable for many reasons, but particularly for the purpose of maintaining uniformity in the work of the inspectors throughout the Dominion. The Fruit Marks Act prescribes the same standard of packing, marking and grading for the whole of Canada, implying that the same ideals of grading, packing and packages prevail everywhere. This is far from being the case.

The chief fruit districts are separated by thousands of miles, and have climates varying from the southern temperate to the Arctic. Under such circumstances it is absolutely necessary to have the inspectors under the personal influence of one or two individuals who can visit frequently all parts of the Dominion and correct any misconceptions with reference to grades and marking that may arise as the result of climate, modes of culture, or other local causes. The degree of uniformity that has been already established has added very much to the reputation and price of Canadian fruit in foreign markets.

During the shipping season Mr. Baker visited the maritime provinces, taking note of the inspection work there, but was employed for the most part at the port of Montreal. I visited the Northwest and British Columbia as well as the fruit districts of Ontario.

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FRUIT INSPECTION.

The method of inspection remains practically the same as in former years, with this difference that the staff has been more thoroughly organized and are of course more thoroughly familiar with their duties, with the result that a much larger percentage of fruit was examined this year than in any other since the passing of the Fruit Marks Act.

The time of the staff at Montreal, Halifax and St. John has been distributed so as to have one or more inspectors on the docks night and day while fruit is being loaded.

The general principles that guide inspectors in their work may be condensed from their instructions as follows:—

1. Disturb the fruit as little as possible consistent with a thorough examination.
2. Leave fruit and package as nearly as possible as it was found.
3. When all fruit cannot be examined look at the pack of shippers previously convicted of fraudulent marking or packing, or those who have been warned.
4. Examine varieties likely to be wrong, such as those shipped out of season, those subject to insect or fungous pests, and those in poor packages.
5. Do not delay fruit in transit, except where violations are strongly suspected. Where there are reasonable grounds for suspecting fraud, do not hesitate to retain fruit till a thorough examination is made.
6. Do not interfere between buyer and seller, or allow your examination or inspection reports to be used for the advantage of either. Inspectors are in no sense referees.
7. Report promptly the condition of fruit and packages when either is defective.
8. Make a note of any rough handling of fruit by railway employees or long-shoremen and report to their respective headquarters.

PROSECUTIONS.

It was found necessary this year to make thirty-seven prosecutions for violations of the Fruit Marks Act.

It is very noticeable in the export trade that the offence so common some years ago of facing barrels with good apples and filling the main portion of them with a poorer grade is rapidly disappearing.

INSPECTION OF SHIPMENTS VIA THE GREAT LAKES.

The apple producing districts of Ontario border on the Great Lakes and the Georgian Bay. It is therefore not remarkable that in the trade with the Northwest a very large quantity of the fruit is shipped from the lake ports. A careful inquiry was made from the various transportation lines doing business from the lake ports as to the quantity of fruit shipped by each. The aggregate reaches 128,000 barrels of apples. This is about one-third the total amount exported from the port of Montreal during the season, a quantity sufficiently large to demand considerable attention. The greater part of these shipments originate, of course, between Sarnia and Collingwood. The time of one inspector is very largely taken up during the shipping season with this fruit. But the fact that they originate at several different points makes it difficult to inspect any large proportion of the consignment. So far the trade has been moderately satisfactory. Nevertheless there is some cause for complaints in the way the fruit is handled, and still more complaint is made of the want of facilities for quick and safe handling at Port Arthur and Fort William.

In addition to the trade to the Northwest, there has grown up a very large trade with the ports on the north shore of the Georgian Bay, from which points the fruit is probably distributed to the miners' and lumbermen's camps, as well as to the new settlements of this district.

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AMENDMENTS TO THE FRUIT MARKS ACT.

At the last session of Parliament the Fruit Marks Act was amended, the chief changes being in sections 4 and 6 which now read as follows :—

‘ 4. Every person who, by himself or through the agency of another person, packs fruit in a closed package, intended for sale, shall cause the package to be marked in a plain and indelible manner, in letters not less than half an inch in length, before it is taken from the premises where it is packed,—

‘ (a) with the initials of his Christian names, his full surname, and his address, or, in the case of a firm or corporation, with the firm or corporate name and address;

‘ (b) with the name of the variety or varieties; and

‘ (c) with a designation of the grade of fruit, which shall include one of the following four marks, viz., “Fancy,” “No. 1,” “No. 2,” “No. 3,” but such mark may be accompanied by any other designation of grade or brand, provided that such designation or brand is not inconsistent with, or marked more conspicuously than, the one of the said four marks, which is used on the said package.

‘ 6. No person shall sell, or offer, expose or have in his possession for sale, any fruit packed in a close package upon which is marked any designation which represents such fruit as of—

‘ (a) “Fancy” quality, unless such fruit consist of well grown specimens of one variety, sound, of uniform and of at least normal size and of good colour for the variety, of normal shape, free from worm holes, bruises, scab and other defects, and properly packed;

(b) “No. 1” quality, unless such fruit consist of well grown specimens of one variety, sound, of not less than medium size and of good colour for the variety, of normal shape and not less than ninety per cent free from scab, worm holes, bruises and other defects, and properly packed;

‘ (c) “No. 2” quality, unless such fruit consist of specimens of not less than nearly medium size for the variety, and not less than eighty per cent free from worm holes and such other defects as cause material waste, and properly packed.’

The following changes will be noted in section 4:—

1. A firm or corporation title may be used.

2. The numerals 1, 2 and 3 must be used to designate grades. X’s may accompany them.

3. Markings must be in letters at least $\frac{1}{2}$ inch in length.

The changes in section 6 are:—

1. The definition of the grades of fruit ‘Fancy,’ ‘No. 1’ and ‘No. 2.’

2. The ‘Fancy’ is a new grade with no imperfect or small fruit.

No. 1 grade consists of 90 per cent perfect fruit, not less than medium size for the variety.

No. 2 grade must have 80 per cent of fruit free from defects that cause material waste and all the fruit must be nearly medium in size.

The changes introduced have been undoubted improvements. Comparatively little confusion has been experienced with reference to the new grades. Nevertheless the shippers were not all uniform either in their grading or in their marking.

The chief confusion in marking arose in connection with the use of numerals and X’s to designate the grade of fruit. As was to be expected, a very large number of the shippers did not inform themselves of the change, and their first shipments were marked with X’s only. All cases of this kind that came under the notice of the inspectors were followed by a letter to the shipper, and in only a few cases was the mistake repeated. Towards the end of the season an increasing number of shippers marked their fruit with numerals only.

MARKING OF APPLES.

A large number of shippers have preferred to mark their barrels with both numerals

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and X's. In such cases the Fruit Division has assumed that 'XXX' corresponds with 'No. 1,' 'XX' with 'No. 2' and 'X' with 'No. 3.' Early in the season a few shippers graded their fruit 'No. 2 XXX.' They were warned that this use of 'XXX' along with No. 2 was contrary to the provisions of the Fruit Marks Act. The designations of grade given in section 4 (c) may only be accompanied by another designation of grade when such designation 'is not inconsistent with, or marked more conspicuously than the one of the said four marks which is used on the said package.' It was held that 'XXX' conveyed the idea of a higher grade than No. 2 and was therefore inconsistent with that grade mark. This indefiniteness was taken advantage of by certain shippers for fraudulent purposes. It will, therefore, be necessary in the interest of the trade, to insist upon consistency in the marking of packages. The use of such words as 'extra,' 'choice,' 'selected,' except with grades No. 1 and 'Fancy' are liable to constitute a violation of section 4 of the Fruit Marks Act.

MARKING SHOULD BE PLAIN AND INDELIBLE.

Very many complaints are yet made owing to the large number of shippers, more particularly for the local markets and the interprovincial trade, who mark their barrels with lead pencil only. The policy of the Fruit Division so far has been to warn shippers with reference to marks that are not 'plain and indelible,' but the line between a 'plain and indelible' mark and that which is not so, is so indefinite that there is frequently great difficulty in determining the line of demarkation. A mark that may be fairly plain and may, perhaps, be considered indelible at the time of shipping proves through the exigencies of transportation to be neither 'plain' nor 'indelible.' Shippers should provide themselves with stencils and stencilling outfit, so that they will not expose themselves to the liability of fines for violating section 4 of the Fruit Marks Act. The best substitute for a stencil is a rubber stamp. This, while it may be plain and indelible, it is not nearly so satisfactory in practice as a stencil, except on dressed lumber and for short inscriptions or numbers. It can be taken for granted that there are few, if any, marks made with a lead pencil, that will be regarded as 'plain and indelible.' Therefore, shippers who use only a lead pencil may render themselves liable at any time to be punished for violating section 4 of the Fruit Marks Act.

GRADING.

The change under section 6 from one defined grade to three defined grades, though somewhat radical, did not prove particularly confusing. This arose from the fact that the amendments protected the best growers and all well-intentioned packers in what would have been their practice without these amendments. A comparatively few fraudulently inclined dealers who traded upon the good reputation of Canadian marking and packing established by honest men, called for special attention from the inspectors.

FANCY GRADE.

Very few packages of the fancy grade were packed, and of those that were so marked a very large proportion were below grade. It is to be hoped that in the future a trade in the fancy grade of apples will be developed. The apple growers of Washington and Oregon are shipping a grade of fruit in comparatively large quantities that would correspond to our fancy grade. This proves that there exists a demand for this class of fruit. The only thing that remains for the Canadian grower is to exercise the same care and vigilance in the growing, grading and packing of his fruit as the American orchardists, to secure an equally good market.

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NO. 1 GRADE.

No radical change was made in the No. 1 grade. It remained practically the same as last year. There was, however, a noticeable improvement in the grading on the part of a very large proportion of the better class of shippers. Nevertheless, it must be confessed that a few unscrupulous shippers have attempted to ignore the requirements for No. 1, and a few of these shipments have been the cause of some criticism in Great Britain.

GRADING TO SIZE AND COLOUR.

The greatest cause for complaint in the 'Fancy' grade and grade No. 1 is in the matter of grading for size and colour. This is important for all grades, but is almost an essential in Fancy and No. 1 fruit. It is a common error to suppose that a few large or very large apples will improve the sale of a lot of medium sized apples, or that a few highly coloured apples will improve the sale of a package containing for the most part apples of only good colour. The reverse is the case. Apples will bring most money when graded so that each package contains only fruit of the same size and colour. It is sometimes asserted by barrel packers that large and small apples in a barrel carry better than fruit of uniform size. The difference between the carrying properties of a well-graded barrel and a barrel of mixed sizes is too small to be taken into consideration, and by no means compensates for the lower price of the poorly graded fruit.

NO. 2 GRADE.

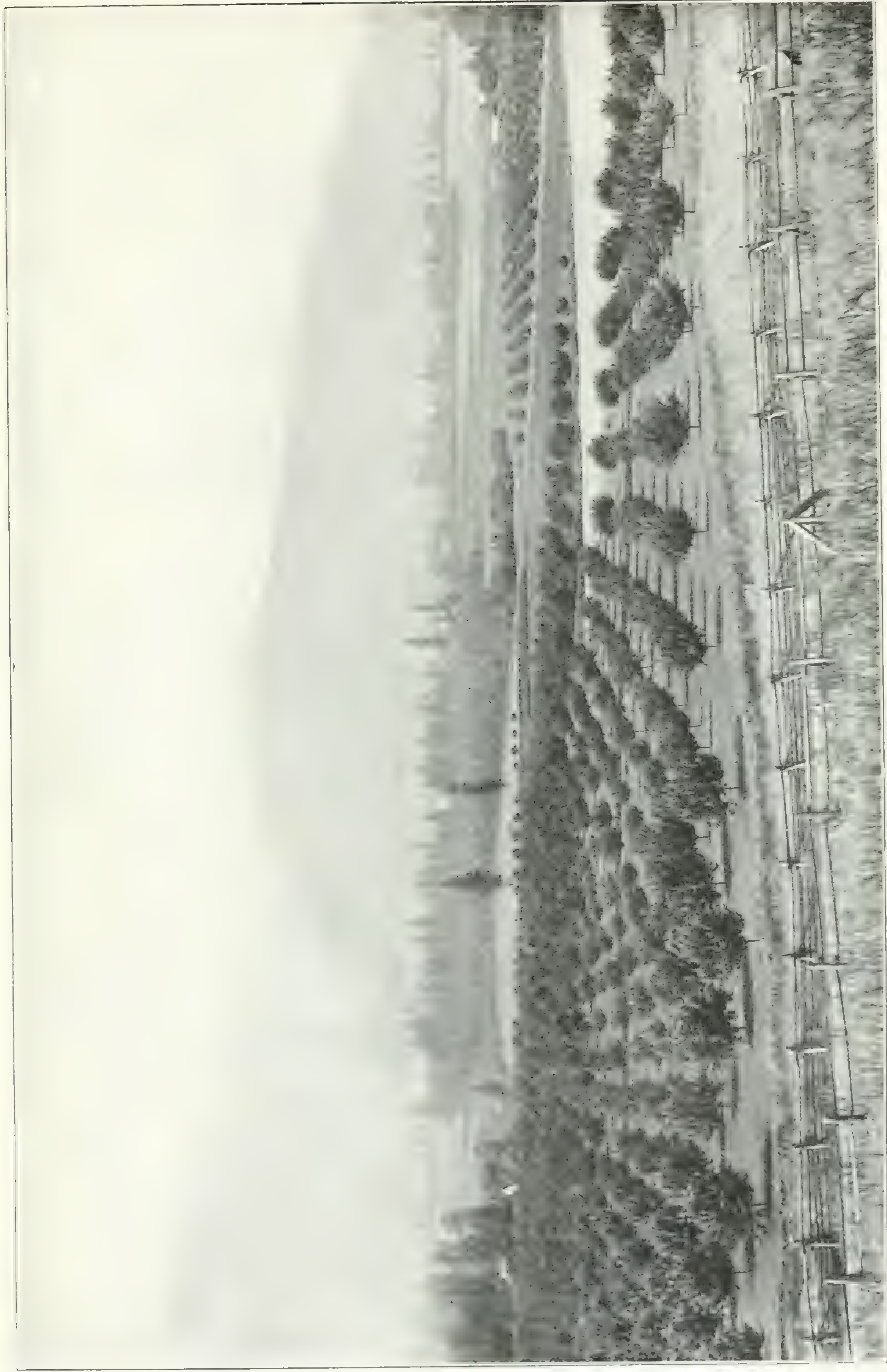
The utmost satisfaction has been expressed with reference to the establishment of a No. 2 grade. In former years, owing to the fact that there was no definition of a No. 2 grade, any grade of fruit below No. 1 could be marked and usually was marked No. 2. The effect, of course, in the local markets where the Act was well known, was to create a distrust of that particular grade, so that it had no market value. The conditions were much worse in the foreign markets. The Fruit Marks Act was not so well understood there, and it was presumed that the No. 2 grade was defined as definitely as the No. 1, and much dissatisfaction was expressed in past years with this No. 2 grade upon the assumption that it was a violation of the Fruit Marks Act not discovered by the fruit inspectors. This defect in the Fruit Marks Act has been remedied by the recent amendments, and now the No. 2 grade sells at fairly uniform prices upon the open market. There is not yet the same uniformity in the different packers' No. 2 grade that there is in the No. 1 grade, but the grade is sufficiently well established to command a place upon the market.

The effect is particularly noticeable in the trade with the western provinces. The demand from there has been hitherto for a No. 1 grade. This, however, could not be supplied, as shippers absolutely refused to send No. 1's without a certain proportion of No. 2's, but with the reputation which the No. 2's had in the past, the No. 2's could not be used to advantage where the cost of transportation was as great as it is in the western provinces. During the past season the merchants of the Northwest have been fairly well satisfied with the No. 2 grade, and it is safe to say that in the future there will be a large and satisfactory trade in the grade.

In the practical working out of the No. 2 grade a condition has arisen which was not clearly foreseen by those who framed the definition. It is stipulated in the definition that not less than 80 per cent shall be free from worm holes and other defects that cause material waste, the presumption being that this 80 per cent, though free from worm holes and such defects, will nevertheless be slightly imperfect fruit, otherwise it would qualify for No. 1 except perhaps upon the score of size. It was anticipated that the phrase 'causing material waste' would be differently interpreted by different



A Nova Scotian Orchard.



A British Columbia Fruit Ranch.



An Ontario Fruit District.



A Canadian Peach Orchard



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packers. Such, however, is not the case to any great extent. The weakest part of the definition is in the allowance of 20 per cent of fruit in a No. 2 package that may be culls. There is no definition of this 20 per cent except that the specimens shall be nearly medium in size for the variety. As a consequence this 20 per cent is often composed largely of culls that should never go into any package. No reputable packer, of course, puts culls into a No. 2 barrel intentionally, but his less scrupulous neighbour may do so, with the consequence that the grade is usually discounted 20 per cent by dealers, which is a manifest injustice to those who put nothing but useful fruit in No. 2 grade. It would be a very marked improvement in the definition if the intention of the framers of it could have been carried out. This undoubtedly was to have the specimens of the 20 per cent allowance good marketable fruit, though having slight defects causing material waste, but such as could not readily be detected in rapid work.

In order to maintain to the highest degree the usefulness of the No. 2 grade, the inspectors have been instructed to insist very rigidly upon the point of size in the 20 per cent of apples which may contain worm holes and other defects in the No. 2 grade.

NO. 3 GRADE.

The No. 3 grade not being defined, very naturally varies in quality. It is possible to make a grade lower than No. 2 of use for the low priced trade in large towns and cities. Speaking generally, it will not pay to incur all the expenses of careful packing, barrels, freight, commission, &c., for the long distance market. Notwithstanding this, a large quantity of grade No. 3 has been shipped from Nova Scotia, certainly to the detriment of the reputation of Nova Scotia fruit and probably with an actual loss to the shippers. So long as there are poor facilities or none for using No. 3 fruit in some by-product, such as evaporated stock, cider or apple butter, the temptation will be almost irresistible to ship this grade. Evaporators and canning factories can afford to pay more for No. 3 grade than the net returns from the long distance market amount to.

IMMATURE FRUIT.

The shipping of immature fruit is an evil more or less prevalent at the beginning of every season. Where this immature fruit is graded No. 1, it becomes a violation of the Fruit Marks Act. Scarcely less injurious to the trade, but not punishable by law, is the practice of shipping varieties out of season. Not unfrequently we find Baldwins and Spies going on the market for consumption in October and the early part of November. The Ben Davis is frequently sold to unsuspecting victims three months before it is fit for use. It is only fair to say that reputable dealers having storage hold such fruit till it becomes ripe.

THE INSPECTION AND SALE ACT.*

The enforcement of the sections of the Inspection and Sale Act referring to fruit packages has been in every respect successful. It is safe to say that no large quantities of packages were manufactured in eastern Canada contrary to the provisions of this Act. The only exceptions to perfect uniformity were a few packages of the previous year's stock and a few baskets imported from the United States on account of the shortage in Canadian stock. Slight differences between a few of the packages used formerly in British Columbia will be corrected this year. The manufacturers of fruit packages have joined heartily in the movement for uniformity in size. With their co-operation it will be a comparatively easy matter to secure strict compliance with the law.

* In the Revised Statutes of Canada, 1906, 'The Fruit Marks Act,' 1901, is codified with 'The Inspection and Sale Act,' and forms Part IX. of that Act.

AMENDMENTS IN 1907.

At the present session of parliament in amendment to the Inspection and Sale Act has been introduced defining the dimensions of the six and eleven quart baskets. The amendment also provides for making the six quart basket a standard size, instead of the six and two-thirds quarts.

The sections (325-326) of the Act as now in force, affecting fruit packages, read as follows:—

‘All apples packed in Canada for export for sale by the barrel in closed barrels shall be packed in good and strong barrels of seasoned wood having dimensions not less than the following, namely:—twenty-six inches and one-fourth between the heads, inside measure, and a head diameter of seventeen inches, and a middle diameter of eighteen inches and one-half representing as nearly as possible ninety-six quarts.

‘2. When apples, pears or quinces are sold by the barrel, as a measure of capacity, such barrel shall not be of lesser dimensions than those specified in this section.

‘3. When apples are packed in Canada for export for sale by the box, they shall be packed in good and strong boxes of seasoned wood, the inside dimensions of which shall not be less than ten inches in depth, eleven inches in width and twenty inches in length, representing as nearly as possible two thousand two hundred cubic inches.

‘4. When apples are packed in boxes or barrels having trays or fillers wherein it is intended to have a separate compartment for each apple, the provisions of this section as to boxes and barrels shall not apply. 1 E. VII., c. 26, s. 4; 4-5 E. VII., 44, ss. 1 and 2.

‘Every box of berries or currants offered for sale in Canada shall be plainly marked on the side of the box, in black letters at least half an inch square, with the word ‘Short,’ unless it contains when level-full as nearly exactly as practicable,—

‘(a) At least four-fifths of a quart; or,

‘(b) Eleven quarts, and be five and three-fourths inches deep perpendicularly, eighteen and three-fourths inches in length and eight inches in width at the top of the basket, sixteen and three-fourths inches in length and six and seven-eighths inches in width at the bottom of the basket, as nearly exactly as practicable, all measurements to be inside of the veneer proper and not to include the top band.

‘(c) Six quarts, and be four and one-half inches deep perpendicularly, fifteen and three-eighths inches in length and seven inches in width at the top of the basket, thirteen and one-half inches in length and five and seven-eighths inches in width at the bottom of the basket, as nearly exactly as practicable, all measurements to be inside of the veneer proper and not to include the top band: Provided that the Governor in Council may by proclamation exempt any province from the operation of this section.

‘(d) Two and two-fifths quarts, as nearly exactly as practicable. 1 E. VII., c. 26, s. 5.’

FRUIT CROP REPORTS.

The fruit crop reports published monthly during the fruit growing season were continued this year. This feature of the work of the Fruit Division has received the commendation of the fruitgrowers generally and of the various provincial fruit associations. They were issued the last of each month and distributed immediately to all the newspapers and to the public generally. They are, of course, sent regularly to any fruit grower who makes application for them.

FRUIT CROP OF 1906.

The season opened with excellent prospects. The winter injuries were few. The bloom on all kinds of fruit trees was particularly abundant. In small fruits, however,

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particularly strawberries, the winter killing was a noticeable feature. The small snow fall in the northern and eastern portions of the fruit growing belt caused very serious losses in the small fruits, but the increased acreage made up to a certain extent for the winter losses, and the prices, though good, were not phenomenally high. There were also serious spring frosts reported from Prince Edward Island and from British Columbia.

During June and July the weather conditions were not altogether favourable. The temperature was low in June, and there were some severe storms, one developing to the extent of a tornado, injuring the orchards very greatly in western Ontario. The latter part of July, August and the fall months were warmer than usual. There was a somewhat serious storm in the early part of October, accompanied by a fall of snow extending through the Niagara district and Western Ontario. The most serious damage was the breaking of the limbs from the combined weight of fruit and snow. The keeping qualities of the fruit were probably injured somewhat also, though this was scarcely apparent at the time of picking. About the same time the apple district of Nova Scotia suffered from the effects of a terrific wind storm. It is estimated that at least thirty thousand barrels of apples were blown off, half of which afterwards found their way to the foreign market. This will account in part for the large quantity of No. 3 fruit shipped from Nova Scotia. There was also a very light rain fall which materially affected the size of the fruit. Peaches and apples were all smaller than usual. The effect of this was specially noticeable in Nova Scotia. The buyers of export fruit are reporting that of the fruit that was stored for winter shipment, the proportion of small fruit is greater than usual, and in no part of Canada did the winter fruit keep as well as during the previous two or three years.

Summer and fall apples were a medium crop on the whole. The winter apples, or rather such as were considered good storing stock, were decidedly a light crop. This was particularly true of district No. 3 where some of the largest commercial orchards of winter fruit are located. A much larger proportion than usual of fruit from the warmer districts of Ontario was stored and this, no doubt, accounts in part for the heavy percentage of losses in the storehouses for this season.

Pears were a light crop and scarcely sufficient to supply the local markets, so that very few were exported, although there was a demand both in Great Britain and from South Africa. Peaches were above a medium crop and very nearly supplied the local demand. The planting of peaches appears to be on the increase. Plums were a particularly light crop last year, almost a failure. Grapes maintained their reputation for regular and steady bearing. They were a good crop and realized excellent prices. The fungous diseases were less harmful than usual. The tomato crop is assuming greater proportions every year in the fruit growing sections. This year the acreage was larger than usual, but the dry and hot weather reduced the crop per acre somewhat. The weather also had the effect of prematurely ripening the fruit so that it could not be properly handled by the canning companies and many thousands of bushels were lost in this way.

INSECTS.

Insects were more numerous than usual. The Codling Moth was particularly prevalent. The proportion of wormy fruit offered for sale was very large. This defect in the Canadian apples is seriously interfering with the trade, especially in South Africa and Australia, where there is an opening for a very profitable business. The Oyster Shell Bark Louse became in some sections a veritable scourge, particularly along the north shore of Lake Ontario. The Tent Caterpillar and Canker Worm seriously infested Nova Scotia orchards. Injuries caused by the Green Fruit Worm were noticeable on many specimens of fruit that otherwise would have been No. 1. The Rose Bug is becoming more widely distributed and presents a decided difficulty to the fruit growers, especially in grape growing districts. The White Spotted

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Tussock Moth was reported as having caused very great damage in Nova Scotia, marring the fruit as well as eating the leaves. The San Jose Scale is slowly but surely extending in area in southern and western Ontario, and will undoubtedly destroy many of the older apple orchards, especially in the counties of Essex, Kent and Lincoln. The Pear Leaf Blister Mite was also very prevalent last year.

FUNGOUS DISEASES.

The apple scab continues to be the most harmful of all the fungous diseases. Twig blight was never more prevalent than during this year. The same may be said of pear blight. This disease probably accounts for the hesitancy which fruit growers have in making large plantations of pears. In the fruit districts the Clapp Favourite pear has almost disappeared.

The Sooty Fungus, or Ink Spot, is another disease which appears periodically upon the fruit in Ontario orchards. For several years Ontario fruit has been practically free from this mould-like fungus; nevertheless it appeared again stronger than ever during the past season. Owing to the fact that this fungus will develop similarly to our common moulds in a close damp environment, such as the apple barrel affords, thousands of barrels in which the disease could hardly be detected when they were shipped or put into store, were rendered almost unfit for sale when opened up upon the market or repacked later in the storehouses for shipment.

Apple canker has become a serious menace in the old apple orchards of Nova Scotia. It is becoming much more prevalent in Ontario, especially in those sections subject to sun scald and winter injuries.

EXTENSIVE TECHNICAL KNOWLEDGE NOT ESSENTIAL.

There is an opinion among orchardists generally that in order to control the large number of insect and fungous pests which attack their orchards, it is necessary to acquire an extensive knowledge of fungi and insects. Naturally the grower shrinks from the enormous task before him. He has neither the time nor the inclination, perhaps, to devote to such an exhaustive study, and therefore often gives up in despair.

This is a grave mistake on the part of the grower. It is not necessary that he be able to identify every insect that he sees, or should know at sight every disease that develops among his trees, in order to control them. If he would become sufficiently familiar with the two most injurious orchard pests (the Codling Moth and the Apple Scab) to know when and with what to spray to control these, he would incidentally check or destroy nearly all others. That is to say, if he learns how to make and apply the poisoned Bordeaux mixture, three, or better, four times during the growing season, he can count on eighty to ninety per cent of clean fruit and a healthy orchard. But even in these cases the orchard sprayed four times with poisoned Bordeaux mixture would be comparatively free from injury, even though other measures were advisable in the case of a severe infestation of Tent Caterpillar, Oyster Shell Bark Scale or Sooty Fungus. The poisoned Bordeaux mixture, therefore, is the orchardist's mainstay, without which fruit growers' success is always doubtful. Cover the entire surface of bark and leaf with the finest possible spray of poisoned Bordeaux mixture once before the blossoms are open, the second time after the blossoms have fallen and before the little apples have turned down, once again ten days or two weeks later, and the fourth time ten days or two weeks after this. This arrangement is so simple that any orchardist may follow it, and doing so, can be reasonably sure of clean fruit and healthy trees.

It is true that occasionally there are outbreaks of fungous diseases and insect pests requiring other treatment than is here indicated, but the ravages of most of them are confined to comparatively small areas and for limited periods of time. For

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example, the Tent Caterpillar, which created such havoc a few years ago in eastern Ontario, is now doing very little damage in that section. In Nova Scotia, this season, it was the worst pest the growers had to deal with. On the other hand, the Oyster Shell Scale or Bark Louse, which has been this year so prevalent in orchards in the Lake Ontario and Georgian Bay section, has been in former years seriously harmful only in neglected orchards.

In cases of such special prevalence of insects and fungi, it is strongly recommended that specimens and all additional information be sent to the experts employed by the Dominion or provincial governments.

ACKNOWLEDGMENTS.

In this work I beg to acknowledge the help received from Dr. James Fletcher, Dominion Entomologist, and W. T. Macoun, Horticulturist, Central Experimental Farm, Ottawa, in identifying specimens and suggesting remedies.

THE APPLE INDUSTRY OF CANADA.

In recognition of the importance of the apple industry in Canada, it was deemed expedient to make some specific enquiries with reference to some phases of it, of which there is a lack of definite and recent information. To this end the following schedule was prepared and sent to the fruit crop correspondents, numbering about five thousand, distributed over the whole Dominion in proportion to the importance of the industry in each district:—

SPECIAL APPLE REPORT—GROWERS’ SCHEDULE.

Fruit Division.

DEPARTMENT OF AGRICULTURE,
DAIRY COMMISSIONER’S BRANCH,
OTTAWA, November 2, 1906.

Kindly fill out this schedule as fully as possible. It is hoped that all who receive this will fill out such portions of it as they can, and forward it to this office without delay. The answers will be used in compiling statistics of the fruit industry, and no individual names will be used. Do not fail to give *Post Office* and *County*.

1. Name.....
P. O.....
County..... Province.....

2. No. of trees in orchard..... acres.....

3. What is your practice with reference to:—
(a) Drainage.....
(b) Fertilizers.....
(c) Pruning.....
(d) Spraying.....
(e) Cover crop.....
(f) Orchard in soil..... Hoe crop..... Grain.....
Clean culture..... Hog or sheep pasture.....

4. Yield per tree.....
Price per barrel.....
Gross income.....

5. What varieties do you grow?.....

1904.1905.1906.

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6. What six varieties of apples would you select if you were setting out a new commercial orchard on your farm?.. . . .
7. Did you sell your orchard:—
 (a) by the lump?... . . .
 (b) by the barrel on the trees?... . . .
 (c) by the barrel picked?... . . .
 (d) by the barrel picked and packed?... . . .
8. Give the names and addresses of apple buyers operating in your neighbourhood
.. . . .
9. Do you know of any cases of buyers not living up to their agreements.. . . .
10. Give the names and addresses of any individual or firms operating evaporators in your neighbourhood.. . . .
11. Give the names of cider manufacturers in your neighbourhood.. . . .
12. Were any large quantities of apples allowed to go to waste? If so, what was the cause?... . . .
13. Do you know of any farmers who are holding fruit for winter sale?... . . .
14. What insects were prevalent in your district this year?... . . .
15. Was scab more or less prevalent than last year?
16. What other diseases affected your trees?... . . .
17. Other particulars of interest.. . . .

The answers which were returned have enabled us to make a fair analysis of the conditions under which apples are grown in Canada. It is needless to say that there is a very great variation in the opinions expressed as to each phase of orchard practice, but there is a certain uniformity in the different fruit districts. The best analysis of the situation can be made by retaining the geographical subdivisions made of the Dominion for the purpose of the fruit crop reports, which are given below. (See maps of fruit districts.)

- District No. 1.—Counties bordering on Lake Erie, Ont.
- District No. 2.—Counties on Lake Huron and inland to York county, Ont.
- District No. 3.—Counties bordering on Lake Ontario north to Sharbot Lake and Georgian Bay, Ont.
- District No. 4.—Ottawa and St. Lawrence valleys to Lake St. Peter and southwestern Quebec.
- District No. 5.—New Brunswick with northeastern Quebec.
- District No. 6.—Hants, Kings; Annapolis and Digby counties, Nova Scotia.
- District No. 7.—Nova Scotia not included in district 6.
- District No. 8.—Prince Edward Island.
- District No. 9.—Lower mainland and islands, British Columbia.
- District No. 10.—Inland valleys, British Columbia.

SIZE OF ORCHARDS.

Question No. 2 developed very clearly the fact that apple orcharding in Canada is yet in the stage when it is an appendage to mixed farming. There are compara-

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tively few large orchards, and there are many districts where a small orchard is included in every farm. In district No. 1 there were many orchards of five acres, a few were reported as large as 30 acres, and one of 45 acres.

District No. 2 has a larger proportion of small orchards, the average appearing to be between two and three acres, with a few large orchards, principally in the counties of Middlesex and Huron.

District No. 3 has a larger proportion of large orchards, and is the only district in Ontario where it can be said that apple orcharding is taken up as a specialty.

In district 4 the large orchards are confined to the Island of Montreal and a few in the Eastern Townships.

District 5 can scarcely be said to grow apples otherwise than a few for home use.

District 6, including as it does the Annapolis valley of Nova Scotia, is distinctly an apple growing section. Orcharding constitutes the chief business of the land owners; nevertheless there are a few very excellent stock farms, but in almost every case with an orchard as an important side line.

District 7, Nova Scotia, except the Annapolis valley, has a few promising apple sections, particularly in Lunenburg, Queens and Pictou counties. There are other sheltered valleys where in the future it is quite possible apple growing may become a specialty, but with these exceptions it is a district of small orchards, producing few winter apples and scarcely enough of the fall varieties for home consumption. The Provincial Government's system of demonstration orchards will undoubtedly encourage apple growing in all the more favoured parts of the province.

District 8, Prince Edward Island, is another district of small orchards.

Small orchards are also the rule in district 9.

District 10, interior of British Columbia, has many peculiar features which render an analysis of the size of the orchards somewhat difficult. In many cases, orcharding offered such inducements to capital that large companies and wealthy men were induced to plant extensively as in the case of the celebrated Coldstream Ranch in the Okanagan valley. The fact that many of these inland valleys require irrigation has a tendency to limit the orchard planting to men with large capital. On the other hand, the spirit of co-operation in irrigation has been developed whereby it is possible to secure irrigation for small plots, and in numerous cases men with comparatively small plots have invested in a part of large estates which are being broken up and are planting orchards from five to ten acres in extent. Where this is the practice there are comparatively few orchards larger than twenty acres.

LARGE OR SMALL ORCHARDS.

The question of orcharding as a specialty, or as one branch of mixed farming, is being discussed in all apple growing sections. In districts No. 3 and 6, the apple specialist is already in evidence, but the small orchard prevails everywhere else. If we consider merely the question of production, the question must be decided in favour of the large orchard. When the investment becomes a matter of serious concern, the grower is more likely to interest himself in every detail of orchard work. Cultivation, spraying and pruning will be done on time and properly. They will be considered part of the regular work and not something that can be done when no other work is pressing. The specialist provides himself with books, periodicals and proper implements. He is willing to spend money and time to attend fruit meetings. Because of the large quantity of fruit he controls, he receives consideration from buyers and transportation companies.

But there are some disadvantages. The large grower must hire large numbers of men for short periods of time. Thus he pays high wages for indifferent services. In mixed farming the ordinary help on the farm is used. The specialist finds fertilizers a costly and not altogether satisfactory article. On a farm where stock is kept

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the fertilizer question is a simple one. The specialist has to wait long years before his investment earns him a dividend, and every operation must be paid for at top prices, because labour and material are hired and bought for a special occasion. The mixed farmer can do most of the work of developing an orchard with the odds and ends of time that cost him little. It is almost certain therefore that the specialist will be the better fruit grower, but quite probable that the general farmer will grow a barrel of apples at a lower cost per barrel. If the apple specialist makes more money than the general farmer in the aggregate, it is because apple growing is more profitable than the usual branches of mixed farming.

There is another compensation when apple growing is included in mixed farming, that is not the less real because it is somewhat intangible. This is the mental and physical development that comes from a varied occupation. The man who grows any one product exclusively will not get so much for himself out of life, nor give his children such good opportunities as the man who grows several products. And so the position appears to be that special apple growing will give the country the best fruit, mixed farming the best men.

In the size of orchards as in all other things, there is a happy medium. Five acres is the smallest that can be recommended for commercial purposes, but ten acres on the average hundred acre farm would not place the owner in the specialist class.

ORCHARD MANAGEMENT—DRAINAGE.

The third question deals particularly with the details of orchard practice. Very few of the orchards are tile drained. Seventy-five per cent of the returns show that natural drainage is deemed sufficient. No doubt many of these orchards have open drains in the depressions, though no systematic attempt is made to provide for anything more than the disposal of the surface water. The value of tile drains in an orchard is shown by the following typical extract from a correspondent in New Brunswick, who says:—‘A few years ago I put out an orchard of 2 acres, 80 trees. On account of it being wet I lost nearly every tree. I then under-drained the orchard and reset it, and the trees have done well. They are just coming into bearing.’ It is notable that in only two sections is there any large proportion of tile draining being done in the orchards. That is in district 2, where the farmers are noted for the excellence of their general farm practice, and undoubtedly the tile draining has been extended to the orchard as a matter of uniformity to correspond with the rest of the farm. District 3, where orcharding is more of a specialty, is the only other district with any considerable number of tile drained orchards. The peculiar soil formation of the Annapolis valley is a perfectly legitimate excuse for less tile draining being done there than the general excellence of their orchard practice would lead one to expect. It is surprising too, to find that in the irrigated districts comparatively few of the orchards are tile drained, and it is possible that some of the defects that are beginning to be noticeable in irrigated orchards may be traced to this want of tile drainage.

APPLE TREE ROOTS AND TILE DRAINS.

Many correspondents object to tile draining because they suppose that the roots of the trees will enter the tile and choke them. A special enquiry was made with reference to this and it has, I think, been clearly demonstrated that there is not the slightest danger, under ordinary circumstances, of the roots filling the tile. In all the good orchard sections, the rainfall is such that during the greater portion of the season, say from the middle of June until growth ceases in the fall, no water runs through the tiles. This being the case, any roots that may enter the tile earlier than the month of June dry up and decay, and there is no new growth while the tiles are without

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water. In those exceptional orchards, located on slopes or on land abounding in perennial springs, there is a danger of the trees filling the tile. Yet even in that case the process with apple trees is a comparatively slow one. Nevertheless it is a consideration that must be taken into account in tile draining orchards. The conclusion then is that there is no danger of roots filling a tile where, under normal circumstances, the tile does not carry water during the summer months, and that there is a danger of the tile being filled where the tile carries water at all seasons of the year.

FEEDING THE ORCHARD.

A great variety of practice is shown in the matter of fertilizers. Barn-yard manure is the staple in nearly all the orchards of Canada. The experience and conclusions of Canadian orchardists are expressed in the following note: 'We have tried various kinds of fertilizers, but find best results from barn-yard manure.'—Burlington, Ont.

The two districts that use any large quantities of commercial fertilizers are the western counties of Ontario, district 2, and the Annapolis valley, where orcharding is so much of a specialty that stock raising is out of the question. Partly for this reason and partly on account of the nature of the soil, commercial fertilizers have given excellent results. About 50 per cent of the orchards depend almost solely upon commercial fertilizers and cover crops.

PRUNING.

The enquiry with reference to pruning shows very great unanimity as to the necessity of pruning. There is also great unanimity as to the time when this pruning is done, namely in spring. Fully 80 per cent of all the pruning is done at this season of the year. In many cases the reasons given for spring pruning are not that the orchardists consider it the best time for the tree, but that it is the only time when the work can be done conveniently. If it is not done then it is not likely to be done at all.

SPRAYING.

Spraying is a very much neglected orchard operation, but the signs are hopeful. In very many cases, even where the orchardists have not sprayed, they recognize the benefits of it. It is fair to say that spraying is now almost universally recognized as one of the essentials of good orcharding. The Bordeaux mixture is the staple spraying mixture, though there are a surprisingly large number who spray with Paris Green alone. The lime-sulphur wash is used only in districts 1, 2, 9 and 10. Though the San José Scale is responsible for the introduction of this spraying mixture, its use has extended beyond the orchards that are suffering from this very grave pest. Lime and sulphur is proving a most efficient fungicide as well as insecticide, and from the fact that it can be applied at a season of the year when there is comparatively little other work to be done on the farm, its use is more common than it otherwise would be.

As the fruit areas extend and as time advances, insect pests and fungous diseases increase. This by no means implies that the task of growing clean fruit is a hopeless one, but it does imply that much more attention must be given to combating these foes now than formerly. In fact spraying is now recognized as being an essential feature of orcharding, perhaps the most important of all orchard operations. Without it, it is impossible to grow No. 1 fruit or have healthy trees. It would be a mistake, however, to attempt to belittle the labour and cost of the operation of spraying. The work comes at a very busy time of the year and must be done thoroughly and promptly. Spraying will cost very nearly as much as all the other cultural opera-

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tions in the orchard when it is properly done. But the results justify this heavy expense. If we calculate the cost of the operation per acre, it amounts from \$8 to \$10 per acre, or if we count per tree, it will be from 16 to 20 cents per tree. A more encouraging way is to calculate per barrel of fruit which will amount to from 10 to 12 cents per barrel. This heavy cost cannot be avoided, but no operation in the orchard pays better.

NUMBER OF SPRAYINGS.

With reference to the number of sprayings, it is noticeable that a very large proportion of the growers spray only once or twice, very few four or more times. It cannot be too strongly impressed upon orchardists that at least three sprayings with the poisoned Bordeaux mixture are necessary for economical results in apple growing, and that four sprayings in nearly every case. There are exceptional circumstances where it is necessary to spray five times in order to get the best results. In the case of the sooty fungus, a pest that has developed abnormally this last year in western Ontario, it is necessary to spray much later than would be necessary ordinarily for the apple scab. The following extracts illustrate prevalent sentiments on the subject:—

‘Fruit growers are now willing to admit the necessity of spraying thoroughly.’—Cambridge, N.S.

‘In regard to spraying, it is a case of do it or get out of the business.’—Bloomfield, Ont.

‘I must say there is no good in having an orchard in this part unless it is sprayed most thoroughly.’—Ingersoll, Ont.

‘I lost this year’s crop of Gravensteins by not spraying. They set full and hung on for about three weeks, when in about two days they all dropped off. Those who sprayed had a fair crop.’

‘I have sprayed thoroughly for several years with excellent results in regard to spot. Our apples the last two years have been practically clean. My Gravensteins are said to be the best grown in Annapolis valley this year.’—Berwick, N.S.

‘This district being more suitable for mixed farming, the apple trees that are planted here are mostly neglected as regards spraying and pruning, and a law should compel spraying; done as it is at present, it is an injustice to the people that do spray. Next to me is a neighbour’s old orchard with every tree alive with bark lice.’—Hall’s Prairie, B.C.

‘I have been packing apples around here, and can see a great difference between the sprayed and unsprayed.’—Goderich, Ont.

Bandaging the trees as a remedy for the Codling Moth is only rarely practised, though some report good results by simply placing rags in the crotches of the trees and killing the larvae so trapped.

COVER CROPS.

The value of cover crops is generally recognized, particularly in districts 2, 3 and 6. The British Columbia orchardists are also alive to the question of cover crops. Clover is the most popular; buckwheat ranks second, followed by rye, vetch, oats, peas, barley and rape. It is noticeable, though, that the larger proportion of orchards are still left in sod. Of those reported not in sod, fully one-half are kept in clean culture; a very large proportion of the remaining orchards are occupied with hoe crops. Sheep are pastured apparently quite frequently in orchards. Hogs are almost universally confined in orchards for at least a part of the season. In western Ontario and British Columbia many orchards are reported as being used as poultry yards.

A general survey of the orchard practice would indicate that there is need yet for much education along all lines. The want of special orchard tools is evident.

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YIELD PER TREE.

The yield per tree, as indicated by the returns, is exceedingly variable, the returns showing from one-third of a barrel to five barrels per tree. The largest yields per tree come from Western Ontario. In districts 1, 2, 3 and 6 the average for the last three years would be about two barrels per tree. In districts 4 and 5 the average was about 1 to 1½ barrels per tree.

PRICES.

It is rather difficult to secure any general results in the matter of price. The price in various sections varied greatly during the same year. Even the price to different individuals in the same locality varied too much to make it a mere matter of chance. It is somewhat difficult to determine whether the difference in price in the same locality is the result of a difference in the quality of the apples or a difference in the relative shrewdness of the buyer and seller. From a comparison of the returns of individuals it would appear that both elements have an influence. It is distinctly noticeable that in unsprayed, uncultivated and uncared for orchards there is a lower yield per tree and a smaller gross income; the well cared for orchards frequently yield very large returns. Nevertheless, many facts appear in the examination of these reports which go to show that apple growers are not well informed upon market conditions, and that in those sections of the country where buyers are depended upon for the disposal of the crop the fruit growers allow themselves to be imposed upon by not being informed thoroughly of the market conditions ruling at the time of the sale. These returns, taken in connection with the fruit crop reports of the season, contain numerous records of sales early in the season, made before the exigencies of market and weather could be accurately determined. In nearly all such cases the farmer has been the loser. This is to be expected from the fact that the dealer has larger opportunities and stronger incentives to make himself familiar with market conditions, and has probably more experience in determining the quantity and value of the product of the orchard. It can be taken as a principle in the selling of apples that the farmer is at a disadvantage in selling early in the season before the conditions and quantity of the fruit, as well as the price, can be somewhat accurately determined.

GROSS RECEIPTS PER ACRE.

Two-thirds of those who made reports gave \$60 to \$100 as the gross receipts per acre from their orchards. Very few gave less than \$40. Somewhat over 50 per cent of the remainder gave between \$100 and \$200 per acre. Some, under exceptional circumstances, gave as high as \$800 per acre. It must be noted here that these returns were made for the most part by the better class of apple growers, but not specialists in apples. They are in general well informed farmers, engaged in mixed farming, with apple growing as a more or less important feature. Under such circumstances it is safe to say that the gross income will average \$80 per acre.

It is interesting to note that even in neglected orchards the revenue is as large if not larger than from any other part of the farm, where the calculation is based upon the amount of money expended on capital and for current expenses. In the case of well cared for orchards, it is safe to say that there is no branch of mixed farming that yields anything like as large a revenue as orcharding. These returns, showing gross receipts of \$80 and over per acre, were not confined to what is usually considered the most favoured fruit districts. Two orchards in the St. John valley, New Brunswick, with no exceptional advantages, report a gross income of about \$100 per acre. A 4-acre orchard on the banks of the St. Lawrence, below Prescott, with a

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climate too severe for the Baldwin, Spy or Greening, shows a gross income of over \$200 per acre. It is safe to say that in few instances has the expenditure for current expenses amounted to more than \$30 per acre.

VALUE OF ORCHARDS.

Some facts with reference to the value set upon orchards appeared in the reports. In districts 3, 6, 9 and 10 the minimum value per acre for an orchard in full bearing is \$400, and a value is given as high as \$1,000 per acre for some apple orchards, though no sales at that price have been reported. Unfortunately this schedule did not ask for an estimate of the cost of establishing an orchard, though some information was given on that subject. From these returns and from other sources it can be confidently stated that the ultimate cost at the time of full bearing of an acre of apple orchard does not exceed \$200, including the price of land, cost of trees, interest on investment, as well as current expenses till the trees return a revenue.

NEGLECTED ORCHARDS.

On the other hand, it must be noted that the returns show there are many orchards that do not yield any considerable revenue, and some that probably do not pay expenses, but in these cases there are exceptional circumstances, such as the planting of useless varieties, want of organization for selling purposes, or negligence in culture.

METHOD OF SELLING.

Different customs prevail in different parts of the country in the matter of selling the apple crop. In district 1 a very large proportion of the orchards were sold by the 'lump.' Nearly all the remainder that were barrelled were sold by the barrel picked, the packing being done by the buyer. A very small proportion were sold by the barrel, picked and packed, and by the barrel on the trees, the buyer doing the picking. It is noticeable that in districts 1 and 2 there was a large number of orchards where the whole product went to evaporators or canning factories. In district 2 about an equal quantity is sold by the barrel picked, and by the barrel picked and packed by the farmer. In district 4 a very large proportion of the orchards are reported as having been sold by the barrel, picked and packed, though there was a large number of orchards sold in this district by the lump. In district 4 it is the almost universal rule for the grower to pick and pack the apples, or pick them at least. In district 6, the proportion of barrels packed by the growers themselves is very large, amounting probably to 75 per cent of the total product on the reports submitted. In British Columbia it is the almost universal practice for each grower to pick and pack his own fruit in boxes, where the packing is not done by a co-operative association.

EVILS OF LUMP BUYING.

Nearly all the correspondents agree that at least 25 per cent of the apple crop in Ontario is bought by the lump. A very large proportion of the buyers place the amount as high as 50 per cent. The remainder is then bought by the barrel, sometimes the picking and packing being done by the grower, and the packing in nearly all cases being done by the buyer. This exposes one of the greatest evils of the present system of handling the apple crop. Buying 'by the lump' is rarely, if ever, profitable to the grower. The average grower cannot gain as complete a knowledge of competing crops and probable market conditions as the buyer. Neither is the grower so skilled in the art of estimating a crop. The buyer's experience usually extends over many years and in

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a great variety of orchards. The grower, therefore, whose experience is confined to his own, perhaps, small orchard is no match for the buyer. The usual result is that the farmer parts with his apples for a sum much less than they are actually worth. The evil does not cease here. The grower, having disposed of his crop, has to a certain extent lost interest in it, and if we will believe the stories of the buyers, the loss from neglect to properly protect the fruit between the time of sale and the time of packing is in itself the loss of a large per cent of the crop. This feature of the case, no doubt, is a very serious one.

UTILIZATION OF WASTE PRODUCTS.

An additional consideration is the ability to use the waste products. In a few cases where the buyer has bought the whole orchard, he may be able to utilize the lower grades of fruit to better advantage than the grower could for this particular deal, but if the custom were universal for the grower to retain control of the lower grades of his own fruit, there would be greater encouragement for canning factories and evaporators and for the manufacture of cider and other apple products. There are many points in the apple districts where it would pay well to establish an evaporator if the owner of the evaporator were sure of the waste products each year, but where there is such uncertainty as to how the lower grades will be disposed of, whether by the farmer or by the buyer of the higher grade of apples, no manager of an evaporator would invest capital. When the grower sells by the barrel the local evaporator would be reasonably sure of the lower grades of apples, but he may sell the next year by the lump, in which case the local evaporator probably would not get the waste.

Another feature of the case, worthy of consideration, is the tendency of buyers to pack fraudulently. In their effort to get as much as possible out of the orchard they lower the grade of both No. 1 and No. 2, endeavouring if possible not to have any No. 3 grade. Many of the prosecutions under the Fruit Marks Act can be traced to the 'lump' orchards.

PICKING AND PACKING BY THE BUYER.

Foremen employed by apple operators are usually paid \$2.50 per day; the rest of the gang are paid from \$1.50 to \$2 and expenses. Farmers seldom pay even \$1.50 for trained labour, and make no effort to secure help at anything higher than this, and yet they complain bitterly of the scarcity of help. Undoubtedly, if they would offer the wages given by the apple buyers, they would secure help quite as readily; and the farmers could use their help much more economically than the dealers. If the farmer counted the picking and packing of the apples as part of the regular routine of the farm, it could be made to supplement other farm work, so that it would cost for labour what farmers usually pay for permanent help. This in itself would be a fair profit, but the largest item of saving would not be the difference in the cost of labour, but would be in other items of expense. The dealer is obliged to pay not only for the transportation of his men from orchard to orchard at frequent intervals, but also for their time as they proceed from orchard to orchard. It is impossible for him to economically employ his men during wet days, yet under one form or another he is obliged to pay his men for such lost time. Nor can the apple buyer give that close supervision to the work of his men, that will ensure the time being well employed, that the farmer can who has the immediate oversight of his men. These considerations show how much cheaper it would be for the farmer to do his own picking and packing than to have it done by the apple dealer.

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PICKING BY THE OWNER.

If the grower would do his own picking there would be less injury to his trees. This is an item that is not often taken into account by orchardists, notwithstanding its importance. Careless pickers, by breaking off the fruit spurs in the rough handling of ladders and by climbing among the limbs, frequently reduce very seriously the future bearing capacity of the tree.

Where the grower does his own packing the grading should be much better and should secure for the fruit a better price.

Again it is important that the picking and packing should be done at the proper time, thus materially reducing the waste as the result of picking fruit before it is in its prime or after it has reached maturity. The buyers in offering a price, either by the barrel or by the orchard, take this matter into consideration, so that the cost of these things, whether the grower appreciates it or not, falls immediately upon the orchard. It is fair to add here that dealers will not buy 'farmers' pack' readily. They complain that the different lots lack uniformity and that the pack is not always honest. There is some truth in this complaint, but the fruit inspectors' reports show that the farmers' pack have fewer violations of the Fruit Marks Act than the dealers' pack. Poor packing and want of uniformity in grading are the worst defects.

BOARDING THE PACKERS.

About 50 per cent of the farmers who sell their apples, board the men during the time they are picking and packing the fruit. This practice of boarding the men at the place where the picking is done, is a decided lessening of the expense to the apple buyer and does not in all cases mean a corresponding increase of expense to the farmer.

COST OF HARVESTING AND STORING.

Below is given a fair estimate of the cost of harvesting a barrel of winter apples by the usual methods:—

Expense for time, &c., in buying	10 cents per bbl
Cost of barrel.. . . .	35 "
Picking	15 "
Packing.. . . .	15 "
Hauling to station	5 "
Freight to storehouse.. . . .	30 "
Ordinary storage.. . . .	7 "
Shrinkage.. . . .	20 "
Repacking in the warehouse.. . . .	15 "
Office work, &c.	10 "

These calculations are made on the presumption that the apples are bought at first hand. Quite frequently the man who does the storing and shipping does not do the buying in the orchard, in which case additional charges must be added for profits to one, two or sometimes three additional middlemen. If the apples are exported to Great Britain, to this must be added freight, \$1; selling charges, 35 cents; exchange, &c., 10 cents; which with the cost of the apples on the tree, say \$1, bring the net cost of the barrel of apples in Great Britain to \$4.07.

Of course by reducing one or other of the various items enumerated above, in some way dealers are frequently able to get apples to Great Britain at much less than this cost; yet it is safe to say that as ordinarily handled there are few No. 1 apples that reach Great Britain at less than this figure.

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CO-OPERATION.

Of course, the ideal way for the apple growers of Canada to harvest and sell their apples is by the co-operative method. In this way one secures every advantage of selling individually along with all the advantages that come from handling in large quantities; that is to say, the co-operative method combines the best features of individual harvesting and selling, with the best features of selling to large dealers and with few or none of the disadvantages of either of these schemes. In addition, the co-operative method has a distinct educational value that has undoubtedly improved, to a very marked degree, the quality of the fruit grown by the members of the association. It is safe to say that this improvement would not have taken place had all the work been done by the individuals themselves or had the fruit been sold to the dealers in the ordinary way.

VARIETIES GROWN IN CANADIAN ORCHARDS.

As was to be expected, the list of varieties reported in answer to question 5 was a large one, yet notwithstanding this there is a fair degree of unanimity with reference to some 15 or 20 varieties, and a very large proportion of the correspondents unite in growing about one dozen varieties. This is a feature of exceptional value that has done much to increase the reputation of the Canadian product in the British markets. Nevertheless, there are yet too many varieties and many that might be discarded. The Baldwin is most largely planted, followed very closely by the Northern Spy and Greening, Fameuse (Snow), Russets, Ben Davis, Duchess, Wealthy, for Eastern Canada. In British Columbia the King, Spy and Spitzenberg are in the lead, although the Baldwin is still a favourite. It is noticeable that the Gravenstein is not largely planted except in Nova Scotia and British Columbia, the extreme east and west of Canada. During the last few years a great many Ben Davis apples have been planted in the principal apple growing sections of Canada, east and west. There are indications in the answers given to the next question that there is some hesitation on the part of orchardists in recommending it for further planting.

The following 25 varieties will include nine-tenths of all the apples grown in Canada. The number following each variety indicates its relative popularity with planters, taking the Dominion as a whole:—

Spy..	202	Fameuse..	28
Baldwin..	192	Ribston..	28
Greenings..	140	Astrachan..	27
Ben Davis	114	Mann..	25
Kings..	102	T. Sweet..	22
Duchess..	87	Blenheim..	21
G. Russet..	74	Nompareil..	18
Wealthy..	73	McIntosh H.	17
Snows..	61	Pewaukee..	12
Gravenstein..	50	Stark..	11
Transparent..	41	Belleflower..	10
Alexander..	31	Colvert..	6

VARIETIES RECOMMENDED BY GROWERS.

Some very interesting inferences can be drawn from the answers to question 6. Correspondents are asked to name 6 varieties each would plant in a commercial orchard. Naturally these six varieties vary according to the district, but within districts there is a fair degree of unanimity.

In District 1, the following varieties in the order of their popularity were recommended:—Baldwin, Spy, King, R. I. Greening, Golden Russet, Ben Davis, followed by the Duchess, Fameuse (Snow), Wealthy and Blenheim.

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For District 2:—Spy, Baldwin, King, R. I. Greening, Ben Davis, Golden Russet, followed by McIntosh Red, Wealthy, Duchess and Ontario.

For District 3:—Spy, Baldwin, Ben Davis, Stark, Golden Russet, R. I. Greening, followed by Wealthy, Fameuse (Snow), and Duchess.

For District 4:—McIntosh Red, Wealthy, Duchess, Alexander, Fameuse (Snow), Yellow Transparent.

For District 5:—Alexander, Fameuse, Wealthy, Duchess, Baldwin, McIntosh Red, followed by Russet, St. Lawrence, Yellow Transparent and Tetofsky.

For District 7:—Baldwin, Gravenstein, King, Nonpareil, Spy, Wealthy, followed by Stark, Ben Davis, Duchess.

For District 8:—Spy, Ben Davis, Alexander, Wealthy, Gravenstein, Stark, followed by Baxter, Duchess, Russet, Wolfe River and Transparent.

For District 9:—King, Spy, Gravenstein, Wealthy, Duchess, Baldwin, followed by Yellow Transparent, Ontario, Alexander, Golden Russet, Jonathan and Ben Davis.

For District 10:—Wealthy, Spy, Jonathan, McIntosh Red, King, Baldwin, followed by Gravenstein and Duchess.

THE SELECTION OF VARIETIES.

The question of varieties is a complicated one. We must take into consideration climate, soil, markets and even the idiosyncrasies of the grower. A grower who intends to grow high class dessert apples for a personal market may wisely choose varieties for which his patrons are willing to pay a suitable price. It is quite probable that the varieties would not be at all suitable for the general trade. So, too, the local market can use a variety unsuited for general planting because it is too tender to ship, though such are sometimes very prolific and locally profitable. Climate must be taken into account, both for hardiness and time of ripening. Considerable latitude may be allowed in soil, but even here there is a choice of varieties. It may be said in a general way that the needs of the local and personal markets are best met by varieties numerous enough to cover the entire season, and so varied in quality as to suit the taste of individual customers. The export and long-distance trade is best served with the fewest possible varieties that will cover the season and meet the reasonable general demand for differences in use and in flavour.

TOPGRAFTING.

Canada has a great advantage in the export trade in growing largely only a few varieties; nevertheless there are still too many undesirable varieties in the average Canadian orchard. It is to be hoped that the subject of topgrafting will be taken up seriously so as to reduce these to the lowest possible limit. Varieties can be changed in about three years, and any tree that possesses a good trunk can with more or less care be made into a good topgrafted tree. It is better to change the variety by topgrafting even where the variety is not in itself objectionable on any score, except that there are but one or two of these trees in the orchard. It adds very much to the value of the orchard to have these odd varieties transformed to the standard varieties grown. The reputation of packers has been injured by the mixing of two varieties in a barrel. This, in many cases, has come about by picking an odd tree of another variety with the main crop, and thoughtlessly including it in the general shipment. Of course, no matter how desirable this variety may be when grown in large quantities, if there is but a single package, or a part of a package, it usually goes to waste.

On the other hand, we must not run to the extreme of putting all our eggs in one basket. Few varieties bear every year. The orchardist who has a number, even a

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small number, of varieties, will have a better chance for a uniform crop than the man who devotes himself to a single variety or even to two varieties. It is conceded also that there should be for the purpose of pollinization at least three varieties intermixed in every plantation. In the distribution of the work, too, it will be found much better to employ fewer men for a longer time than to have a large number for a short time. This is a very important consideration when orcharding is a part of the general system of mixed farming.

POPULAR VARIETIES.

The Spy, Baldwin and King are easily the prime favourites at the present time with intending planters. The Spy, always popular for home consumption, has established its reputation in the British market, particularly in Liverpool and Glasgow. The King commands a higher price, but the taste for the Spy is growing, and it is not improbable that this difference in price will soon disappear. It must not be forgotten, however, that high flavour is only one element in determining the market value of a variety. The consumer is not the absolute dictator in determining the price to the grower. The fruit has to pass through the hands of four or five middlemen, who exercise the greatest influence on the price. The ordinary consumer, of course, wants good fruit, but does not always know it by name or when he sees it, and quite frequently is not willing to pay a price corresponding to its value. The shipper above all things wants a safe fruit, and is willing to pay for it, especially if it is attractive in appearance. Quality counts for little with the middlemen for the general market.

THE NORTHERN SPY.

It is, therefore, not surprising that the Spy has made its way more slowly than its merits either as a cooking or dessert apple would seem to warrant. It is popular with the growers, too, because it is prolific, almost equalling the Baldwin and Greening in this respect, when once the trees have reached maturity.

Its defects, however, are numerous. The shipper finds that it does not stand transportation well. It bruises easily and shows nearly always a large percentage of 'slacks' and 'wets,' and not infrequently the loss on these more than counterbalances the profits on the sound fruit. The shopkeeper finds that it will not 'stand up' long enough to enable him always to dispose of his whole stock. He buys in small lots to avoid waste, just as the shipper pays a comparatively low price to protect himself from probable shipping losses. Thus it is not a great favourite with the shipper and the merchant, because it is 'wasty,' but the grower has confidence in it because of its high quality, its productiveness and its value for the local market. The consumer always likes it when he can get it sound and well-grown.

It has another defect not always taken into account. It is a long time coming into bearing. The period varies with the soil and climate. A light soil, subject to a late summer drought, will bring it into full bearing six or eight years sooner than a deep rich clay loam, but of course these conditions would be relatively as effective for other varieties. We can, therefore, assume for eastern Canada that the Spy will be at least six years longer in coming into full bearing than the Ben Davis. In counting the cost of growing the Spy we must reduce the extra six or eight years' wait to the terms of dollars and cents. We must debit it with the cost of pruning, spraying and culture amounting to not less than \$12 per year per acre. We must also debit it with the interest on investment and if we compare it with the Baldwin, or Ben Davis, we must also make allowance for probable profit on these before the Spy comes into bearing. Doing this, it will make the cost of growing Spies at least 35 cents per barrel more than Baldwins or Ben Davis. The consumer, of course, would have to pay this in addition to a sum that would cover the extra losses in shipping and storing. Box

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packing and better shipping methods, for which we have good facilities at the present time, will tend to improve the price of the Spy to the grower.

TOP-WORKING TO CORRECT DEFECTS IN THE SPY.

Many correspondents have recommended as a method for growing Northern Spies the planting of some hardy stock like the Tollman Sweet or McMahon White and top-grafting at the age of two or three years. This undoubtedly overcomes to a certain extent the two principal faults of the Spy. The top-grafted trees will come into bearing a number of years sooner and the faulty crotches that are so marked a feature of the Spy tree will also be corrected. Nevertheless, this method is not to be recommended except where practiced by a skilled orchardist or by a farmer who has more than the usual amount of decision of character and business ability. The danger is that these trees will never be top-grafted. As a matter of fact, there are very few orchards where this scheme of top-grafting on hardy stock has been carried through with sufficient uniformity to be successful. The large number of trees of inferior varieties in almost every commercial orchard in the country, which might so readily be transferred into profitable varieties by top-grafting, show how hopeless it is to expect the average orchardist to top-graft at the proper time or, in fact, to do it at all. It cannot be said that the operation is a difficult one, and it certainly is not beyond the ability of fruit growers, even those below average intelligence, but the fact remains that the operation is not performed. With the average farmer and fruit grower it is safer to take the risk of the extra wait and the poorer tree, than the chances that the top-grafting will not be properly done where other stock than the Spy is used.

The Baldwin still remains the great market apple, and, all things considered, appears to be about the safest winter apple on the list.

The King maintains its place on account of its high quality and appearance. Nearly all correspondents report that it is a shy bearer, but more prolific when top-grafted. It brings the grower usually no better price than the Baldwin or Spy. It is difficult to see on what grounds it is recommended for commercial orchards, except for the local and personal market. It certainly is much less profitable than any of a dozen other standard varieties.

The Rhode Island Greening is limited by the tenderness of the tree, but within its area few apples appear to pay better. It has made its way in Great Britain, where for many years its colour created a prejudice against it. Besides being somewhat tender in the tree it scalds badly in storage, and it shows injuries from scale or scab most readily. Its earliness is also somewhat against it as a storage apple, but it suits southern Ontario as a fall shipper.

The Golden Russet is still a prime favourite in the foreign markets. It is even more popular in France than in Great Britain. French buyers could not secure enough of the 1905 crop and made inquiries for 1906, but the short crop in Canada and the good crop in France created a want of confidence in the market that is not justified by present prices in France. Unfortunately it is a shy bearer, and too small to pick and pack rapidly.

The Ben Davis is not recommended by growers with enthusiasm, yet all who grow it report that it is one of the most profitable varieties, if not the most profitable variety in their orchards. Its one defect is lack of quality, a defect that is often magnified by putting it on the market early in the season. It must not be forgotten that in denying quality in the Ben Davis, we are appealing only to the Canadian-American standard of taste. The English and French standards are certainly different. It is not improbable that the standard that places the quality of the Blenheim Pippin and Cox's Orange above the Northern Spy and Fameuse, will find much to commend even in the Ben Davis.

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VARIETIES FOR DISTRICT NO. 1.

One of the most surprising features of the reports from district No. 1 (Southern Ontario) is the subordinate place given to early varieties. The Astrachan had scarcely a friend, the Duchess was mentioned more frequently, but only as a fifth or sixth choice. Only one grower was planting early apples extensively. The demand for early apples is increasing very rapidly. No new plantings of early varieties are being made here, and comparatively few early varieties exist at the present time. Yet Southern Ontario can place the Duchess or Astrachan on the market, two, perhaps three, weeks before they are ready to ship for districts where they are planted largely and where they are profitable. Hence it would seem that Southern Ontario is eminently situated to develop a most profitable early apple trade. The staple varieties grown at present, winter varieties for the province generally, become fall and early winter fruit here. Buyers will not purchase them for ordinary winter storage. They, therefore, come on the markets during the season of cheap apples, from October to the end of December, with the last of the early apples, and with the apples grown to perfection in the colder portions of the province, such as the Wealthy, Fameuse and Wolf River. If winter varieties grown in southern Ontario were placed in cold storage warehouses as soon as matured, or even if care were taken to give them the very best treatment in ordinary storage, they might be shipped with little loss. As ordinarily handled by apple operators, the loss when shipped in the winter months is very great, except when the summer and fall months are unusually cool. Cold storage treatment would bring the cost of the apples above those grown in the distinctively winter apple belt, districts 2, 3 and 6, but a handsome margin would still remain to the grower if his orchard is large enough to be taken seriously, or if he is a member of a co-operative association.

In view of the growing scarcity of early apples (those ripening in July and August), it would seem good business for southern Ontario to plant such varieties as Astrachan, Duchess and Wealthy, and perhaps McIntosh and Fameuse. The Gravenstein has been very successful in Ontario, and would make a most acceptable apple to follow the Duchess in season.

VARIETIES FOR DISTRICTS 2 AND 3.

A distinction is made between districts 2 and 3 for fruit crop purposes, founded upon conditions which do not affect materially the question of varieties. Practically the same varieties can and should be grown in both districts in commercial orchards. Perhaps in no other part of Canada is there so good an adaption of varieties to soil and climatic conditions. It is the region of the best winter varieties. Of course it must be remembered here particularly that there is no line, sharp and distinct, between the different fruit districts; they blend gradually one into the other. Consequently, in selecting varieties for the southern portions of districts 2 and 3 it is quite possible that those found most profitable in district No. 1 would also be most profitable in the adjoining parts of district No. 2. On the other hand, they merge in the north into district No. 4. It would therefore be discreet for those upon the northern margin to inquire carefully before they plant trees less hardy than those recommended for district No. 4. But where the Baldwin and Rhode Island Greening are perfectly hardy, it is safe to say that no better list can be suggested than that recommended by the growers in districts Nos. 2 and 3.

VARIETIES FOR DISTRICTS 4 AND 5.

The varieties for districts 4 and 5 are naturally quite similar, although district 4 is so favourably situated as to be able to grow apples upon a commercial scale with every prospect of success, while district 5, including as it does the colder part of Que-

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bec and New Brunswick, is not so well adapted for commercial orcharding. As a matter of fact, there are very few commercial orchards in the latter district. An exception should be made in the case of the St. John valley and the more favoured portions of southern New Brunswick, which corresponds very closely with district 4, including the St. Lawrence and Ottawa valleys and the eastern townships of Quebec.

The first essential with a variety here is its hardiness. Unfortunately, there are few of the good winter varieties that can be recommended, but as a compensation the hardy fall varieties are grown here to perfection. These include the Fameuse and McIntosh Red, undoubtedly two of the most popular dessert varieties grown.

THE FAMEUSE.

Little need be said in praise of the Fameuse. Its quality, colour, size, productiveness and the hardiness of the tree have made it a favourite as a dessert apple ever since the introduction of orcharding into Quebec and eastern Ontario. It is very susceptible to the apple scab, and cannot now be grown successfully except with the most careful spraying. It is also too tender to ship in barrels, and requires very great care even in boxes, and it comes on the market at a time when apples are most plentiful. Notwithstanding its faults, the Fameuse, properly grown and handled, is in such great demand that good orchards of this variety are yielding better financial returns than those with later varieties in the distinctly winter apple growing belt.

THE M'INTOSH RED.

The McIntosh Red has all the good qualities of the Fameuse as well as its defects, except that the McIntosh is not so well known. It is, perhaps, even more hardy than the Fameuse, and there are not wanting many people who regard it as even better in flavour than the Fameuse. Its distinctive red colour is also regarded as an attraction. It is interesting to note that the McIntosh Red is recommended for British Columbia. It grows to perfection in irrigated orchards, but its susceptibility to the scab is against it in the lower mainland and islands of British Columbia.

It cannot be said that orchardists growing these two varieties are making large returns, but the causes for this are not far to seek. The trees for the most part are left unsprayed. Very few growers, except in British Columbia, are using boxes in shipping them, and fewer still are taking such care in the grading and packing as to commend the fruit to the purchasers of a high class dessert fruit, the only consumers who will pay the proper price for them. The few growers who have handled these varieties properly find them exceedingly profitable. We have a record in the Fruit Division of one orchard of four acres that has made an average over a series of years of \$200 per acre net, and we have reports from other orchards, for single years, where twice this amount has been realized. The demand for this fruit, grown and packed properly, has never been filled, and the prospects are that with the increase of the wealth of our population in the cities the demand for this high class fruit will increase much more rapidly than the facilities for meeting the demand. Orchardists, therefore, in district 4 can with perfect confidence continue the planting of these two varieties. They have stood the test so long and are so well known that there is little risk in planting them largely.

In districts 4 and 5 the Duchess is one of the most satisfactory apples. The hardiness of the tree, the excellence of the fruit and its productiveness strongly recommend it. It has not, however, the highest qualities as a dessert apple, although excellent, and its season, as grown in sections 4 and 5, corresponds very closely with equally good or better apples in more southerly portions of the apple belt, so that it cannot be recommended with the same confidence as the McIntosh Red or Fameuse, though there are few places where it has not paid well when grown in sufficient quantities to

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attract buyers. It grows exceptionally well in the St. John valley, New Brunswick. As grown here it is a much better shipper than when grown further south and can be exported conveniently and safely to the markets of Great Britain. One New Brunswick orchardist reports his gross income on a 12-acre orchard at \$200 per acre, and every orchard of any size reports satisfactory returns. Unfortunately, in New Brunswick the orchards are usually small, and the cost of assembling the small lots of apples, and the time which it takes to do so, count against this variety as it is grown at present, but these objections would all disappear if they were grown in larger quantities. There is a possibility that the St. John valley may become as famous for its Duchess apples as the Annapolis valley has been for its Gravensteins.

The Alexander is also deservedly a favourite in districts 4 and 5. The Wealthy has much to recommend it, and may be safely planted in those districts. It stands up well until December as grown here, and meets the very strong demand at this season of the year for a highly coloured desert apple, not too large. It is exceedingly prolific, comes into bearing quite young, and the tree is very hardy and healthy.

With the five varieties the Duchess, McIntosh Red, Fameuse, Wealthy and Alexander, commercial orcharding could be carried on in districts 4 and 5 with every prospect of as good financial returns as in what are commonly regarded as the more highly favoured sections of the apple belt.

LOWLAND RASPBERRY.

The Lowland Raspberry has occupied a place for a number of years on the fruit list of the Quebec Pomological Society of the Province of Quebec. The apple was introduced by the late Charles Gibbs, and is grown in small quantities in the neighbourhood of Abbotsford, Quebec. There are also specimens on the Experimental Farm at Ottawa. The quality is excellent, the flesh being snow-white, juicy and fairly firm. The ground colour is waxlike, greenish white, three-quarters of it being almost completely covered with light rosy-red splashes, making it a very attractive apple in appearance. It is recommended to take the place of the Yellow Transparent and Red Astrachan. It is a few days earlier than the Transparent. Its shipping qualities have not been tested sufficiently to make it a safe apple for large plantations. The tree is very hardy, but only moderately prolific. If the shipping qualities are equal to the Red Astrachan it will prove a most profitable apple for export and long distance markets from southern Ontario and British Columbia, as well as for local markets, in limited quantities, everywhere.

The growers in district 6, in which are situated the chief commercial orchards of Nova Scotia, have recommended two varieties not largely planted in other districts, namely, the Ribston and the Stark. The Ribston is an old apple, thoroughly tested, but it is doubtful whether it would be largely planted if it were a late introduction. Its quality is good but not high. It is not quite so good a keeper in storage as the standard winter varieties, has not quite so good a reputation, perhaps, as the Blenheim in the English market, and is not very prolific, but has the virtue that its qualities are well known at home and abroad, and it is therefore safe.

The Stark, on the other hand, is a comparatively new apple, which has made its way very rapidly on account, perhaps, of its good keeping qualities and its productiveness. It ranks in general qualities with the Ben Davis and Gano, but is not so attractive in colour as these, though it has the reputation of being somewhat higher in flavour.

One surprise in the list that the growers have submitted from Nova Scotia, is the low place that is given to the Gravenstein and to the Nonpareil, two apples that are grown by nearly every Nova Scotian orchardist. The defects of the Nonpareil are such as cannot well be overcome. It is, therefore, perhaps, deservedly falling into greater or less disrepute.

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The Gravenstein, on the other hand, appears to possess all the virtues, but has one grave defect, which for the past few years overbalanced its good points with the grower. The fruit is of the very highest flavour, appealing to the taste of a very large number of consumers; it is attractive, it ripens early enough to be acceptable, and is exceedingly prolific, but unfortunately of late years the tree is being attacked by collar rot and canker to such an extent that orchardists are afraid to plant it. It is probable also that losses, the result of the slow steamship service and poor accommodation in the past, have had something to do with the waning popularity of the Gravenstein. With the better transportation facilities now at the service of the growers and with the knowledge that the collar rot can be combatted fairly successfully by topgrafting on hardy stock, there are not wanting signs that the Gravenstein will again gain in popularity. A number of the most intelligent growers have expressed the belief that the Gravenstein will still remain the standard Nova Scotian apple.

VARIETIES, DISTRICT NO. 7.

The list recommended by the growers in District No. 7 (Nova Scotia) shows the effects of traditions in apple growing. The list is made up from the reputation of varieties in other districts, rather than from what they have done in District No. 7. None except the Wealthy would be sufficiently hardy to justify their planting in large numbers. It is true, however, that there are numerous valleys and protected hillsides in this district where the varieties given for district 6 as well as district 7 would be hardy. For exposed places or for general planting, the varieties recommended for districts 4 and 5 would be quite suitable. The objection of course to these varieties would be that they are largely summer and fall apples. Some of them, such as the McIntosh Red and even the Fameuse, can be kept till late in January. The time of ripening is not a great objection for the commercial orchard, because just as large returns can be made from these summer and fall varieties of extra choice quality as from the winter varieties. For districts 4, 5 and 7, a comparatively new apple, the Milwaukee, is recommended as a fairly good winter apple. It would not be safe to plant it except by specimen trees until it has been further tested.

THE BLenheim.

The Blenheim, an apple that stands second on the list from the Annapolis Valley, is widely distributed in Ontario, though in small numbers. It is somewhat remarkable that it should not be more popular in Ontario. That the plantations of this variety are not larger, must be attributed, I believe, to the fact that special attention has not been drawn to it by nurserymen or fruit experts, with the result that it is not obtainable in quantities large enough to attract the attention of the buyers. Every report that has been sent in from Ontario with reference to it has been favourable, as far as the yield and quality of the fruit are concerned, and few apples stand higher in the British markets, especially in London. It is prolific, and one of the best shippers of the season, which extends in the Georgian Bay district to the end of January. It makes an excellent apple for southern Ontario for shipment during October, November and December. The skin is tough, does not readily show bruises, and the apple is clean and attractive in appearance, though not high in colour.

VARIETIES FOR DISTRICT 8 (PRINCE EDWARD ISLAND).

The Gravenstein is likely to prove of great value for Prince Edward Island, if it proves sufficiently hardy. It matures a few weeks later than the Gravensteins of Nova Scotia and is equally attractive in appearance. The first picking from Prince Edward

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Island will overlap the later shipments from Nova Scotia, making a continuous Gravenstein season for the two provinces, extending over two months. Prince Edward Gravensteins can be kept without difficulty till December, and even January, but it would be a very great mistake to attempt this, inasmuch as the market will be suspicious as to the keeping qualities and would pay a much lower price in consequence. The best results will be obtained by overlapping, if possible, the Nova Scotia shipments, and supplying the markets continuously as long as the fruit is in good condition. The dealers will have no hesitancy in accepting the Prince Edward Island Gravensteins before they are known as such, and they will gradually associate good keeping qualities with the Prince Edward Island Gravensteins, giving them finally the preference when available.

THE BAXTER.

The Baxter apple has been mentioned by several Prince Edward Island correspondents. This variety has formed a marked feature of the fruit exhibit held each year at the meeting of the Provincial Fruit Growers' Association. The tree is very hardy, and the fruit particularly attractive. The quality is good, but not high. It suits the taste of the British market much better than that of the Canadian. It runs very even in size, and when packed in boxes makes a most attractive package. In this respect it probably is not surpassed by any grown in Canada. It is also grown to a certain extent in northern Ontario, and is very highly commended by both growers and shippers. It is, however, too early for the middle and southern portion of the province, and probably would not be a safe apple to plant except in the colder portions of the apple belt.

VARIETIES FOR DISTRICTS 9 AND 10 (BRITISH COLUMBIA).

British Columbia is a law unto itself in the matter of varieties. There are so many features entirely different from the rest of Canada that it is hardly possible to compare varieties or to use the experience gained in eastern Canada for guidance on the Pacific slope. There are, however, several varieties in common. The King, Spy, Gravenstein, Wealthy, Duchess, Baldwin and McIntosh Red are all recommended for eastern Canada and all do well in British Columbia. It is doubtful, though, whether the King would have been recommended had it not been for the traditions of eastern Canada. It certainly grows to perfection, but is not better than many other varieties that are much more prolific and make perhaps better trees.

The Spy has a good reputation in the Pacific province, as it has in the East, and will undoubtedly always be a standard. The Baldwin is only fairly successful and with the opportunity of growing so many varieties of better quality it will, perhaps, always be low down on the planting list.

It is a matter of surprise that the early varieties were not more highly recommended, especially for the interior. A few have mentioned the Yellow Transparent, but have coupled with it such defects as will surely bar it out as a profitable variety for extensive planting. The conditions in British Columbia vary in the province so widely that it is scarcely possible to pronounce authoritatively yet on varieties for specific districts. Planters, therefore, will have to proceed cautiously. There is much experimental work to be done before confidence can be given to any list for this province.

CRAB APPLES.

Crab apples are scarcely mentioned as a commercial proposition in any province except British Columbia. An inquiry among the growers in other apple districts

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elicited the fact that crab apples have scarcely been worth the packing for the past fifteen years. This is due to the fact that the crab apple is limited to the domestic markets and to the single use, practically, of jelly making. Undoubtedly there has been a surplus of them on the local markets. Consequently after each family has been supplied with one or two gallons, there is no demand for what is left. Even the canning factories failed to appreciate their value for preserved products. During the last two or three years it has been discovered that the markets of the Northwest provinces will take them in fairly large quantities. The British Columbia people were the first to appreciate this; consequently they have been selling crab apples at exceedingly high prices, making them one of the most profitable varieties of fruit in their plantations. Ontario growers are undoubtedly beginning to note that there is an outlet for their crab apples in the same market. The shipments were fairly large in 1905 from Ontario, but have been more than doubled for the season of 1906. Still there were thousands of bushels allowed to rot on the ground.

This comment is made in view of the number of crab apples that are being planted in British Columbia. While it is not easily possible to overdo the market for good dessert and cooking apples, the same cannot be said of crab apples. This caution is not needed in eastern Canada, inasmuch as there have been few commercial plantings of crab apples made during the last fifteen years. This fruit can be grown in all the colder sections of the apple belt, and it would therefore seem a doubtful investment to plant more in the best apple sections than will meet the purely local demands.

THE EARLY APPLE TRADE FOR EASTERN CANADA.

In 1905, the last year for which we have full statistics, American ports exported 445 barrels of apples in July, 1,621 barrels in August, and 274,944 barrels in September—291,410 barrels for the three months. Of this number Canada contributed 152,764 barrels. Nevertheless, during these months we can ripen the Red Astrachan, the Duchess, Wealthy, the Gravenstein, and half a dozen other desirable varieties. The Red Astrachan ripens in southern Ontario, in the most favoured portions, the last week in July, and can be shipped freely the first two weeks of August. The Duchess in the very earliest portions is ready for shipment the first week in August, and could be shipped in good order from different portions of the country for two months. The Gravenstein, and many other varieties are ready for shipment from southern Ontario the middle of September, and from Nova Scotia later in the month. There is no reason, therefore, why this trade should not be encouraged from Canada. The prices are higher than for winter fruit, and considerably higher than the fall fruit. The transportation charges, however, are greater, and more care is required in the handling of the fruit, and of course there are greater risks of all kinds in transit, but, making due allowance for this, there is every reason to believe that this early trade is quite as profitable as the trade in winter apples. The conditions required for this trade are: First, perfect fruit, clean and bright. Second, extreme care in the packing of fruit to insure that it is packed not too green nor yet overripe. Third, the packing must be in boxes, the grading being done very carefully so as to insure uniform size and colour in each package. Of course all overripe specimens will be rigidly excluded. Fourth, the cooling of the fruit before packing, or immediately afterwards, by mechanical refrigeration, or by ice, or, if both are impossible, by exposing the fruit to the cool night air, and packing it in this condition and loading it at once on refrigerator cars. Refrigerator car service is absolutely necessary for the best results, as well as cold storage on board steamship, both of which are now available to the fruit grower. Unfortunately, the early fruit, even where there is considerable quantity of it, requires to be handled so promptly that individual shipments are out of the question. It is impossible to handle it except in carload lots. It is therefore a trade

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which calls for co-operation among growers. Of course an apple operator who would give special attention to this business could in all probability make it as profitable as winter apples, but it is more than probable that his experience in shipping apples would disqualify him from making a success of the early apple business. The methods that are commonly adopted with the winter apple trade would lead to certain failure if applied to the summer apple trade. The orchard packing in the middle of the day, the use of barrels instead of boxes, the careless packing of the fruit in the orchard or at railway stations, and the usual delays in loading the cars would prove most disastrous in the case of early apples.

USEFUL LISTS OF NAMES.

The answers to question 8 have enabled us to complete the list of the apple buyers of the Dominion. The answers to questions 10 and 11 also give us a very useful list of cider manufacturers and the owners of evaporators.

APPLE BUYERS.

The answers to question 9 indicate that there has been a marked improvement in late years in the methods and morals of the itinerant and irresponsible apple buyer; nevertheless, there is not wanting evidence that there still exists a large number of unscrupulous men who prey upon the credulity of apple growers. The methods of these men are various. Indeed the word schemes would perhaps better describe their practices, and these schemes are modified to suit the conditions of each intended victim. A common scheme is to buy apples at somewhat more than the market price, or indeed at any price that will secure them, pay a small sum down and promise the balance later. If the schemer succeeds in disposing of his stock soon enough, so that it is impossible for his creditors to secure any assets, he then declares himself insolvent and offers perhaps part payment for the fruit, declaring himself unable to pay anything more. So skillful have some of these buyers become that they frequently are able to operate two years in succession in the same place. When they are discredited in one neighbourhood, it is but a small matter to move a few hundred miles away, where they are able to work the same scheme on apparently virgin soil. Any one who knows the conditions on the average farm will readily see how large a source of loss this may be. The farmer, ashamed of having suffered a loss, says little about it, even if it is a comparatively large one, and there is no means whereby the reputation of this buyer can be spread broadcast among the growers of another locality, so that it is easy to conceive that a disreputable buyer might operate very close to the neighbourhood where he is utterly discredited.

Injustice is sometimes done by men who cannot be classed as itinerant apple buyers. A case in point is given here which will illustrate the necessity for apple growers exercising every precaution when making a sale of their fruit. An apple grower in western Ontario with an excellent commercial standing sold his fruit to a buyer. The apples were sold on the condition that the grower should do the picking **only**. The buyer was to supply the barrels and do the packing, and a price was agreed upon for all No. 1 and No. 2 apples. The grower performed his part, as he thought, by picking them and storing them in a shed approved of by the buyer. The buyer was notified when the picking was concluded, and several times afterwards. Owing to the scarcity of barrels and other causes, the buyer did not come to the premises to pack until after the winter frost had set in, rendering the apples a total loss. The grower entered suit and lost the case on the ground that there was no complete contract until the apples were barrelled and the amount of culls determined. There was no stipulation in the contract as to the time when the packing should be done. There are two decisions of the courts on record, of cases almost identical with this.

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The obvious conclusions with reference to the sale of apples are, that sales should be made only to well known and reputable dealers who can furnish collateral at the time the fruit is delivered, to the full value of the apples, and such as would be accepted in a chartered bank. Written contracts ought to be made at the time of the sale, and all questions of prices should be settled definitely then; and on questions of grade the Fruits Marks Act should be quoted as the standard accepted by seller and buyer.

WASTE APPLES.

Large quantities of apples, aggregating thousands of barrels, went to waste in districts 1 and 2; some waste was also reported in districts 3, 5 and 8. The reasons given for this are exceedingly suggestive. In districts 1 and 2 the prevalence of extraordinary winds accounted probably for one-third of the loss; want of help for picking the fruit is another important factor; the absence of buyers, exorbitant freight charges, scarcity of cars, want of cold storage and the low prices offered for apples were all given as causes for this waste.

The returns under the head of questions 10 and 11 indicate that the business of manufacturing the lower grades of fruit and waste products of the orchard into marketable by-products is not by any means in a satisfactory condition. The canning industry is apparently hampered and limited by conditions purely artificial, that seriously interfere with the extension of the business of canning and preserving fruit. The business of evaporating apples appears to be in a state of arrested development, with thousands of barrels of good fruit for this purpose going to waste every year. It would seem a confession of failure on the part of fruit growers to note how small a share Canada has in the evaporated apple industry of the world. The United States, with a total production of apples only four or five times as great as that of Canada, has an evaporated industry twenty times greater than that of Canada. Evidently this subject of the waste products of the orchard and fruit plantations of Canada needs thorough investigation.

FARMERS STORING APPLES FOR WINTER SALE.

Nova Scotia is the only province where the farmers store quantities of apples for winter sale. In all other apple producing districts in Canada, the custom is almost universal of selling before frost, to dealers who make a business of storing for winter sales. As far as the export trade is concerned, perhaps there are no objections to this method of doing business. The cost of building a really good frost-proof storehouse is considerable, but the cost is materially reduced when the building can be made large, and the fruit is much safer and can be handled to much better advantage when stored in large quantities. Of course the farmers could have all these advantages and the profits which legitimately go along with this method of working, by organizing co-operatively. The case, however, is different when we come to the local trade. There are very few farmers who could not store a number of barrels of apples in their cellars, or in some other frost-proof place, from which sales could be made very profitably for local consumption. An inquiry made among the grocers of the small towns in the apple-producing districts has shown that in very few cases have there been sufficient apples stored where they were produced for the purpose of supplying local needs. Quite frequently during the winter months the price for good apples is lower in the export market than it is in the towns and villages in the vicinity of the orchards where apples were grown. This, of course, is poor business on the part of the apple growers. Notwithstanding the value of the export market, it is quite secondary in point of profit to the local market up to the limit of its consuming capacity.

The answers to questions 14, 15 and 16 were practically the same as those which were received from our correspondents for the monthly fruit crop reports, under which head they will be noticed.

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Question 17 developed a great many interesting features in connection with the orchard industry. Naturally the growers made this the medium for expressing the grievances under which they laboured in the management of their business.

NURSERY STOCK.

Many correspondents complained of having received wrong varieties and occasionally poor stock from nurserymen. Some few complained of having received diseased trees or trees infested with insects.

TRANSPORTATION ABUSES.

A large list of alleged abuses in connection with transportation might be compiled from the returns. Lack of cars, high freight rates, want of protection at stations, delays in transit and rough handling were all mentioned frequently, and numerous examples of evils not quite so common, such as misrouting of cars, neglect to trace cars asked for, and neglect to settle promptly for the loss of fruit.

LOCAL EVAPORATORS.

Some fruit growers complain very bitterly of the tactics of the owners of local evaporators, who would take advantage of the virtual monopoly of the business which they have in the neighbourhood, and pay nothing more for evaporating stock than the cost of picking and hauling it to the evaporator. This, of course, furnishes a very strong argument for the co-operative ownership of evaporators. In a few places where there was competition, as high as fifty cents per hundred was paid for evaporating stock last year. We have the numerous cases where evaporators paid only fifteen cents per hundredweight, and twenty and twenty-five cents per hundredweight was quite a common price.

GENERAL COMMENTS.

The questions asked in the schedule submitted to apple growers, cover a wide range of subjects. As was to be expected, many of the questions were not answered exhaustively. In fact the answers are in many cases quite as remarkable for what they suggest as for the important direct information which they give.

It must be confessed that the apple industry is not developed as it deserves. The quantity is equal neither to the capacity of the country nor the demands of the market, and the quality is not by any means creditable to the intelligence of the growers.

It is encouraging to note the increased interest in spraying and in co-operative marketing. Along with the improvement in quality and methods of selling will come specific demands for improvements in the railway facilities and also a more intelligent use of low grade fruit, most of which is now wasted.

DEMONSTRATIONS IN FRUIT PACKING.

Each season since the inception of the Fruit Division instruction has been given in packing apples and pears in cases, boxes or barrels. The methods used by the skilled packers employed have been embodied in a bulletin which will soon be placed in the hands of the printer.

Mr. C. E. Stewart, from the Pacific coast, was employed as a skilled box packer to give instruction in the eastern provinces during the season of 1906. In this capacity he visited and gave demonstrations in the following places:—

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Ontario.—Toronto, Simcoe, Forest, St. Catharines, Thornbury, Oakville, Burlington, Chatham, Walkerton, Owen Sound, Brighton, Newcastle, Oshawa, Orillia, Winona, St. Davids, Trenton, Queenston.

Quebec.—Chateauguay Basin, St. Hilaire.

New Brunswick.—St. John.

Nova Scotia.—Falmouth, Wolfville, Kentville, Canning, Laurencetown, Berwick, Annapolis, Truro, Halifax (Dominion Exhibition), Cambridge, Weston.

Prince Edward Island.—Charlottetown (Provincial Exhibition).

FRUIT PACKING.

The effect of the demonstrations of this and former years is clearly discernible in the fruit placed on the general market. Canadian barrel packing is now recognized as the best in the foreign market, and little remains to be done but to maintain this high standard by supplying information and every encouragement possible to young men who may wish to follow this work, as well as to fruit growers generally.

The effect of this work is even more perceptible at the fall exhibitions of fruit. It is largely owing to the work of the Fruit Division that commercial packages were recognized at all upon the prize lists. At first the entries showed serious defects almost universally. At the first provincial fruit exhibition held in Toronto, out of nearly two hundred box packages not one could be recommended as a model. At the last exhibition a very large percentage of all the box packages would be regarded as most excellent examples of the packer's skill if placed on the general market. A few years ago no creditable box packing was done commercially in eastern Canada. At the present time there are several firms that are making a regular business of supplying boxed fruit that for the excellence of the packing is not surpassed by the best work of the fruit men of the Pacific coast. Unfortunately, there are yet too few engaged in the box fruit business in eastern Canada to attract attention on the general market. The signs are hopeful, however, that the provincial authorities will take up the subject of box packing and make instruction in this art a regular part of their institute work. The co-operative associations are also active agents in better packing and packages. The combined results will be that the fruit grower will get more for his fruit, and the consumer better satisfaction for his money.

ATTENDANCE AT FRUIT GROWERS' MEETINGS.

The services of the staff of the Fruit Division have been called into requisition frequently to take part in fruit meetings. In nearly every case these have been under the auspices of the various fruit growers' associations. The members of the staff have also acted very frequently in the capacity of judges of fruit at fall fairs. They have been enabled in this way to promote the commercial side of fruit growing, and to disseminate in a very practical way a knowledge of the Fruit Marks Act. It is needless to say that, from the very nature of their work, they have been able to accumulate much information that is of value to those who are actively engaged in the growing of fruit. It is therefore desirable that they should meet fruit growers individually and in special meetings as frequently as their other duties will permit.

Mr. Baker attended fourteen fruit growers' meetings in Ontario; Mr. P. J. Carey six; Mr. A. Gifford, sixteen; Mr. Vroom ten fruit meetings in the maritime provinces, and in addition delivered a series of lectures at the short course in horticulture at the Truro college. Mr. C. E. Stewart was engaged to give special demonstrations in box packing. He visited for this purpose the chief fruit districts of Ontario, Quebec and the maritime provinces.

I attended fruit meetings at the following places, delivering an address upon a fruit topic in each: The Canadian National Exhibition, Toronto; the Experimental

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Union, Guelph; Ontario Fruit Growers' Association, Toronto; the New Brunswick Fruit Growers' Association, Fredericton; and special meetings at Canton, Brighton and Belleville, in Ontario. I also attended fruit meetings at New Westminster, Victoria, Hammond and Nelson in British Columbia.

POWER SPRAYING.

The Fruit Division has been experimenting with power spraying for four years under many different conditions. The primary object was to demonstrate the conditions, favourable and unfavourable, of spraying by contract, as grain threshing is now done in many parts of Canada. The scheme is an attractive one to those interested in orcharding. Seventy-five per cent of the millions of barrels of apples grown in Canada are grown by men who cannot be described as fruit growers. They are general farmers with small orchards of one to five acres. Such growers find spraying a particularly disagreeable operation. It takes the same outfit to spray one acre as ten, and the outfit is somewhat expensive considering the limited use to which it is put. The time taken to prepare the mixtures and machine is about the same for a small orchard as for a large one, and the work, to be effective, admits of no delay, and comes at a very busy season. The results are not seen immediately, nor can they be tested definitely except by methods few farmers will apply. It will be admitted readily by those familiar with the conditions on the average Canadian farm that objections less powerful than these will prevent spraying being done in small orchards with sufficient promptness and regularity to be effective. It was hoped that contract spraying would overcome these difficulties. The results of our four years' demonstrations do not show that all the difficulties in the way of contract spraying can be readily overcome. The advantages of contract spraying are many. The man who undertakes it finds it quite as remunerative as threshing by contract. Farmers are glad to pay from four to five cents per full grown tree for each spraying with poisoned Bordeaux mixture. The sprayer can make from \$10 to \$15 per day, or if conditions are favourable, even \$20, for an outfit costing about \$300 in addition to his own time and that of two assistants and a team of horses. The daily outlay for gasoline, or other power, would not amount to more than fifty cents per day. The amount of skill required is not so great as to prevent any one succeeding at spraying who has made a success of threshing. But conscientious carefulness in preparing and applying the spray is essential. It would seem at first sight that spraying by contract should be a success. But it is not. Only two or three outfits are in operation in Canada, so far as can be ascertained. The difficulties in the way are as follows:—

There is no test that can be applied easily and definitely that will positively prove the quality of the work. When a thresher does his work the bushel measure is there to decide beyond cavil how much work has been done. A very simple examination at the tail of the machine, or on the straw stack, will determine at once the quality of the work. There is no such standard for the work of spraying. The sprayer may be using an almost useless mixture, or may be applying a good mixture carelessly, yet he cannot be easily detected at the time, or even afterwards. The benefits of spraying are too much obscured by other circumstances to serve as a measure for the quality of work done in spraying. When the bushel measure or the yard stick can be applied to spraying, then we may hope for the extension of contract spraying.

CO-OPERATIVE SPRAYING.

The difficulties in the way of contract spraying are in a large measure removed when the spraying is done co-operatively. The work is then done as if the many small orchards were parts of one large orchard controlled by one owner. It is difficult to get farmers to co-operate for the single operation of spraying, but where there is co-

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operation for selling, co-operation for other purposes is easier. Nearly every co-operative selling association is also spraying co-operatively, with excellent results.

POWER SPRAYING VERSUS HAND SPRAYING.

Though the primary object of the Fruit Division was to determine all the conditions surrounding contract work in spraying, yet many other features were developed.

In comparing power spraying with hand spraying, it was not found that all the advantages were on the side of the power outfit.

The advantages of power spraying are as follows:—

1. The pressure on the pump is more uniform and it is easier to secure a high pressure, giving of course a finer spray.

2. Fewer men are required.

3. The work can be done more cheaply in large orchards.

The disadvantages are:—

1. The outfit is expensive at first cost and also for repairs.

2. It requires considerable familiarity with machinery to run it successfully.

3. It is inconvenient on soft ground such as would be found in a cultivated orchard at the first spraying.

The hand pump is cheap, simple in construction, light to work in soft ground and thoroughly effective where a high pressure is maintained.

It is a common error to suppose that the power pump will throw the spray much higher than the hand pump. Neither will throw it against the wind, or perpendicularly, more than a few feet from the nozzle, if it is as fine as it should be; nor will it do good work if the spray is coarse. No attempt was made to test the efficiency of different makes of power sprayers.

CO-OPERATION.

The subject of co-operation among fruit growers in harvesting and selling the crop is of more than ordinary interest to the Fruit Division. Apart from the very great benefits accruing to the fruit growers themselves by the adoption of co-operation, the Fruit Division has an interest in this movement in connection with the enforcement of the Fruit Marks Act. Under the usual method of selling fruit the operations and conditions all tended to bring about infractions of the law. Under the influences at work in the co-operative associations the tendencies are all in the other direction. For the purposes of the enforcement of the Fruit Marks Act, therefore, it can be said that the formation of every co-operative association is an aid to our work. A logical result of this is, that the members of the staff in addressing fruit growers' meetings pay particular attention to the subject of co-operation.

It is gratifying to note that there are now thirty-five associations in active operation. A bulletin has been prepared upon the subject, written with a view of giving further support to this movement.

IDENTIFICATION OF VARIETIES.

There has been a very large increase in the number of specimens of apples sent in to be named. It is certain that many very serious mistakes have been made in varieties as the result of confusion in names. The following case is typical: A farmer having the usual small orchard with numerous varieties, finds that a variety of which he has a few trees is in every way desirable under his conditions. Determining to enlarge his orchard, he very naturally selects the greater portion of this variety. Seven

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years later when his new planting begins to bear a few specimens, he begins to suspect that the trees in his young orchard are not true to name. Two or three years later when all come into bearing, and a full investigation has been made, he finds that he was mistaken in the name of the original trees that did so well in the old orchard, but the nurseryman gave him the variety he ordered. This mistake cost him many hundreds of dollars. It is quite probable that before his error was corrected, he had perpetuated it by recommending to other intending planters his old favourite misnamed trees.

Every fall fair at which there is an exhibition of fruit, illustrates the confusion which exists among small growers in apple nomenclature, and demonstrates the commercial importance of correct naming.

The members of the Fruit Division staff, having experience in all parts of the Dominion, are well qualified to render assistance in this work. Specimens may be sent postage free; at least four should be sent, in all respect characteristic of the variety. These should be accompanied by a letter giving information as to where and how they were grown, their season, the characteristics of the tree, and any other facts that might affect their condition or quality.

I have the honour to be, sir,

Your obedient servant,

A. McNEILL,
Chief of Fruit Division.

PART V.—COLD STORAGE.

GENERAL.

The question of cold storage has been considered in Canada chiefly from an export point of view, but the rapid increase in population, especially in the western provinces, where the production of the perishable products of the farm is not large enough to supply the local needs, means a great growth of the internal trade of the country in these products.

The geographical features of Canada, the diversity of its climate and products, the sharp contrast in the seasons, the immense distances which separate the different parts of the country, and the ability of the people to purchase largely of the good things of the earth, all combine to make the question of cold storage of great importance in this country from the standpoint of domestic trade alone.

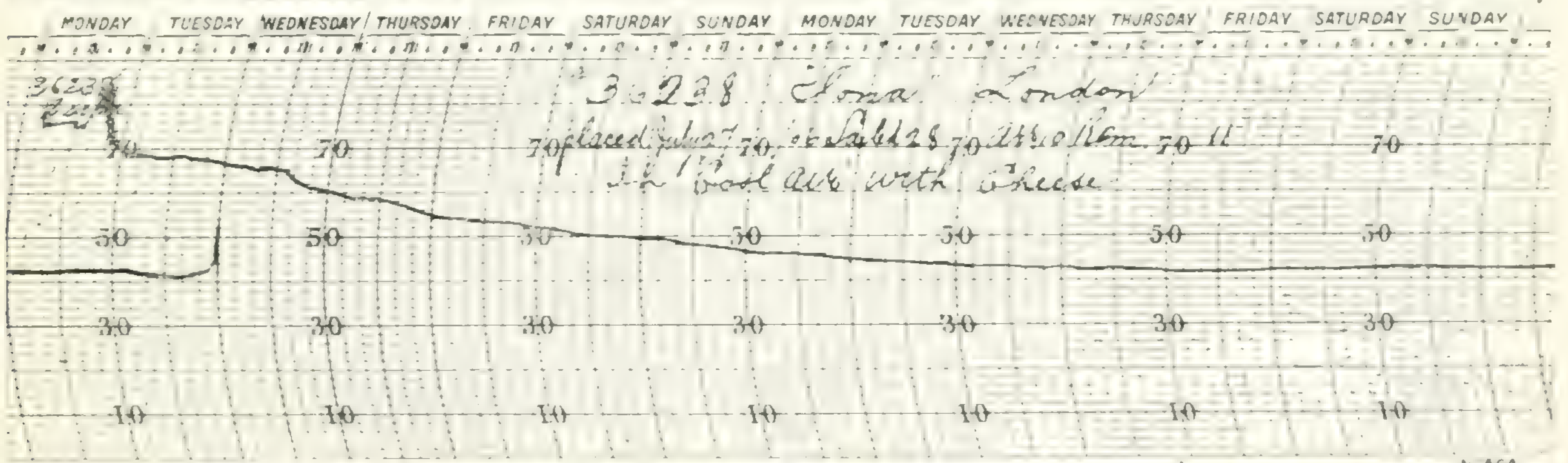
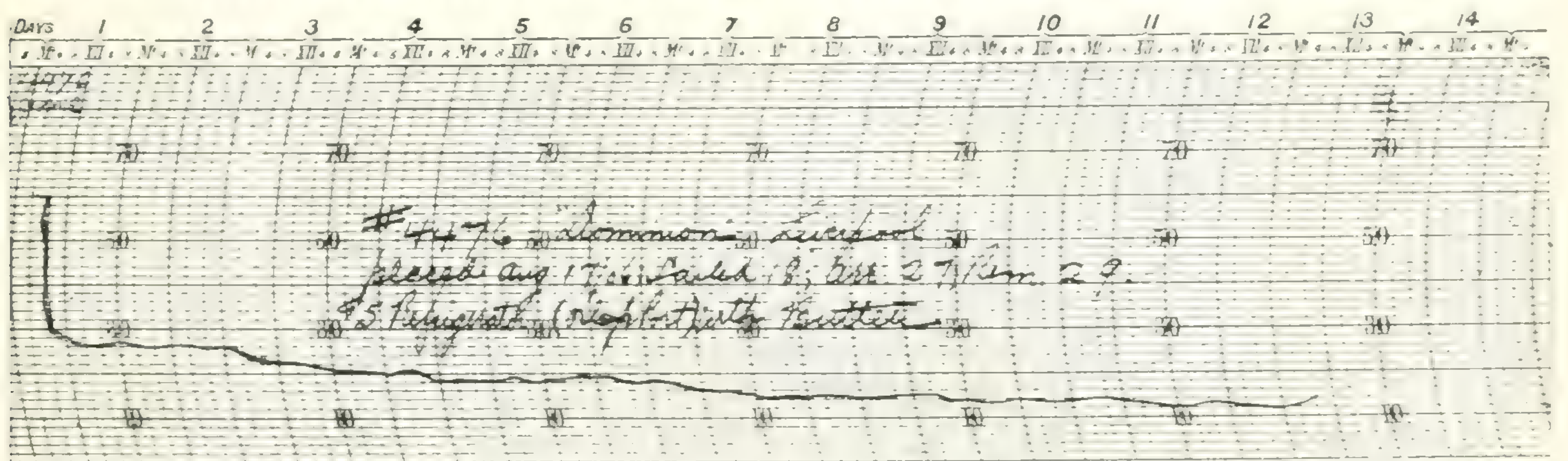
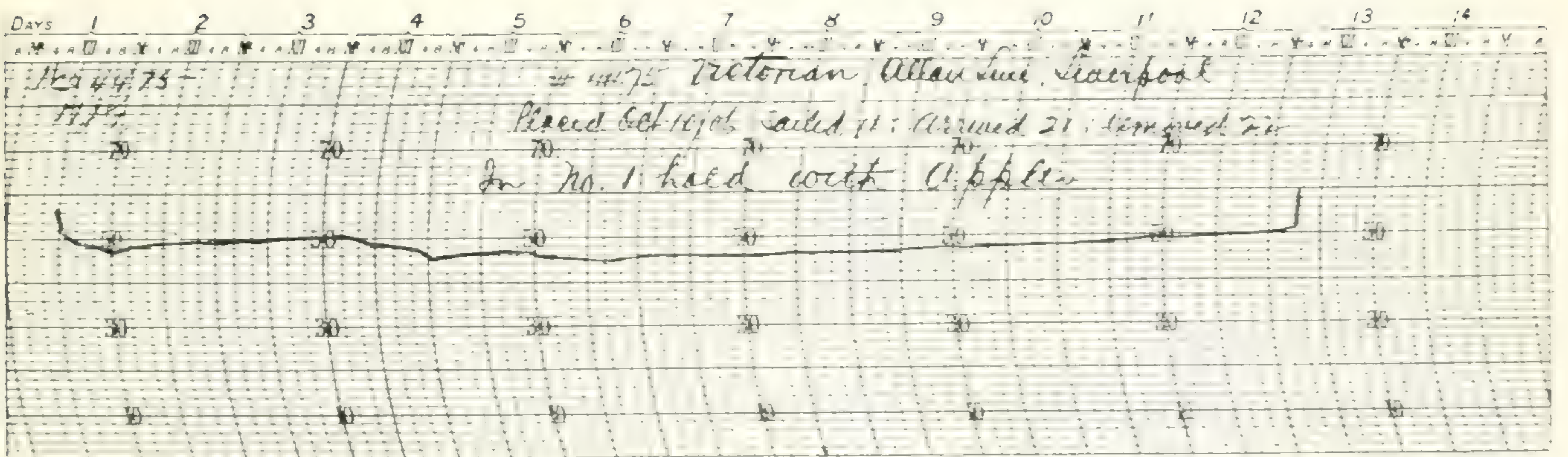
It enables the fruit grower in southwestern Ontario and in British Columbia to ship his tender products to the farthest points reached by the railroads, and thus it makes the whole of Canada a market for what could otherwise be disposed of in very limited areas only. The period during which some of the early maturing and choicest varieties of apples are available can be extended for several months, and thus the outlet for an enormous production of fruit in favourable localities is provided and the inhabitants of the districts which are not adapted for the growing of fruits are enabled to procure a regular supply in good condition, at fairly reasonable prices.

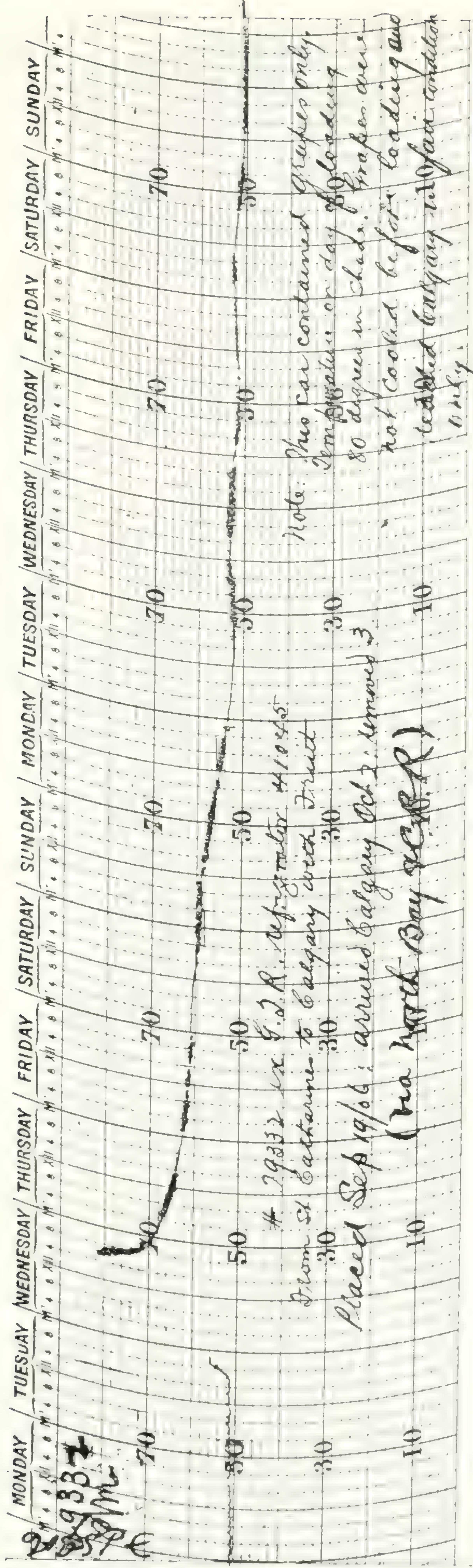
Cold storage enables the dairyman to store his surplus butter and cheese during the active season of production and to dispose of it during the off season, when manufacture has almost, if not entirely, ceased. Prices are equalized and the consumer is supplied with an article in better condition throughout the whole year than would otherwise be possible. Not only is the business of the producer enormously increased, but the commerce of the country derives a corresponding benefit.

COLD STORAGE FOR FRUIT.

The fruits of Canada are noted for their tender, luscious qualities, which is synonymous with saying that they require careful handling and protection, to check the rapidity of their life processes, as compared with the drier and less juicy fruits grown in other climates.

There is no food product grown in Canada which comes within the perishable class, to which the use of cold storage can be applied with more benefit than it can be to some of the fruits. The apple is Canada's most important fruit, and not the least dependent upon cold storage if the most is to be made out of the crop. Every farmer who keeps a few barrels of apples for his winter use recognizes the effect of cold storage in prolonging the life of his apples, by keeping them in a cellar which will be as cold as possible without freezing. What is not so generally recognized is the fact that low temperatures are most effective to this end if the apple is placed therein *immediately* after being taken off the tree. When this course is adopted, the ripening process is checked at a time when it would naturally proceed very rapidly, especially as the warmest weather to which the apple will be exposed is likely to prevail at the time the crop is being harvested. A few days' cold storage at this stage is of more value than as many weeks later on. There are districts in Ontario admirably adapted for the growing of apples, but where the length of the warm season frequently causes great loss and discouragement to the grower, by carrying the apple to a stage of ma-





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turity which interferes seriously with its keeping quality. Cold storage would be of especial benefit to the apple grower in such localities.

COLD STORAGE FOR BUTTER.

All creameries, worthy of patronage, are now equipped with a cold storage room of more or less efficiency, in which to hold the butter for a few days before shipment, and there is ample cold storage accommodation in Montreal for butter awaiting export. It must be admitted that there is still room for improvement in the creamery cold storages, but one of the greatest needs at the present time is for better methods of handling the large quantity of dairy butter which is produced. In the first place, every farmer who makes butter to sell should provide himself with a supply of ice, to insure proper temperature in the manufacture of the butter and to keep it cool until he is able to market it; and the merchant who deals in dairy butter, and often accumulates large quantities, has quite as much need for a cold storage room as the creamery has. It would add many thousands of dollars a year to the value of dairy butter manufactured in Canada, and give the consumers a much better article, if the merchants who handle the butter were provided with proper storage facilities. There has probably been a little tendency to neglect dairy butter in some of the schemes for improvement, on the ground that the creamery industry should be encouraged as much as possible, being the best in the end for all those who desire to engage in butter-making. There are, however, a large number of farmers in Canada who are not within reach of either a cheese factory or a creamery and who are obliged to manufacture butter themselves as the only means of disposing of their milk.

CREAMERY COLD STORAGE.

The government offered a bonus of \$100 to creameries for the erection and maintenance of a small cold storage according to plans and specifications prepared and furnished by the Dairy and Cold Storage Commissioner. There were 57 applications for bonus in 1906. Of this number 25 were approved and received the full bonus. Others were held over to give the owners another chance to comply with the conditions by making improvements suggested by the inspector.

COLD STORAGE SERVICES.

The various cold storage services arranged for by the Department of Agriculture, and which are supervised and administered by this branch, have now been established so long and are so well known that further description would seem to be superfluous. Briefly, the different plans of the Department of Agriculture for assisting in the preservation and safe transportation of perishable food products are as follows:—

Iced butter cars.—A regular weekly or fortnightly iced butter car service from the butter-producing districts to Montreal and Quebec, effective May 7 to October 21. These iced cars are available for the shipment of butter in any quantity, at stations on the route. Shippers are charged the current tariff rates. The Government guarantees the earnings of two-thirds of a minimum carload and pays the railway \$4 per car for icing.

Iced cheese cars.—A service of iced cheese cars, effective July 1 to September 9, for the shipment of cheese, in carloads, at current tariff rates. The cars are supplied by railway agents on demand of shippers, and the government pays icing charges to the extent of \$5 per car for a limited number of cars per week on the different railway lines. The total number of cars which may be supplied under this arrangement is 105 per week.

Iced fruit cars.—A service of iced cars for fruit in carloads intended for export via Montreal or Quebec, effective August 1 to September 30. The cars are supplied

by railway agents on demand of shippers, and the government pays icing charges to the extent of \$5 per car.

A staff of inspectors are employed to see that these services are properly carried out. For details see Part III. of this report.

TRANSATLANTIC COLD STORAGE.

During the season of 1906 there were 240 sailings of steamers from Montreal and Quebec having cold storage accommodation, the combined space amounting to 4,885,094 cubic feet distributed as follows:—

	No. of sailings.	Cubic feet.
Bristol.. . . .	31	899,849
Glasgow	61	872,025
London.. . . .	63	1,116,683
Liverpool.. . . .	75	1,921,537
Manchester.. . . .	10	75,000
Totals.. . . .	240	4,885,094

COOLED AIR SERVICES, SEASON, 1906.

In 1906 there were 82 sailings of steamers from Montreal with cooled air accommodation, the combined space amounting to 4,119,304 cubic feet, distributed as follows:—

	Cubic feet.
To Bristol	185,940
To Liverpool.. . . .	782,952
To London	3,150,412
Total.. . . .	4,119,304

SHIPMENT OF PERISHABLE PRODUCTS, SEASON 1906.

No absolutely exact records are kept of the quantities of perishable produce shipped in cold storage chambers, cooled air compartments or in ordinary storage, from the port of Montreal, but the following figures, compiled from reports received from our cargo inspectors, are approximately correct for the total shipments from Montreal to ports in the United Kingdom for the season of navigation, 1906. In this statement the quantities shipped from Quebec, per Empress steamers, are also shown. In each case American produce is included.

SHIPMENTS FROM MONTREAL TO PORTS IN THE UNITED KINGDOM, SEASON 1906 (U.S. PRODUCE INCLUDED).

	In Cold Storage.	In Cooled Air.	In Ordinary Storage.
Cheese (boxes)		394,022	1,815,299
Butter (packages)	366,642	658	1,020
Bacon (packages)		87,823	126,236
Apples (barrels)	4,880	3,878	366,363
" (boxes)	2,944	553	17,777
Tender fruits (packages)	30,993	2,103	173

QUEBEC TO UNITED KINGDOM PORTS PER EMPRESS STEAMERS.

Cheese (boxes)		12,007	17,312
Butter (packages)	1,012		
Bacon (packages)		3,409	12,517
Apples (barrels)			13,882
" (boxes)			676

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The quantities shown under the heading 'In Cooled Air' include only goods on which the extra cooled air charge was paid. On nearly every voyage, however, more or less perishable produce, paying only the ordinary rate, received the benefit of cooled air transportation, either because of lack of space in the general holds, or for the sake of convenience in handling the cargo.

The cold storage on steamships is now provided without any subvention from the Government.

For further particulars of cold storage on steamships, including thermograph records, &c., see Part III.—Extension of Markets.

BUTTER IN STEAMSHIP COLD STORAGE.

During the season of navigation of 1906, the cargo inspectors at Montreal tested the temperatures of 1,751 packages of butter as these were being loaded into the steamers. After taking the temperatures each package was marked so as to enable the inspector at the port of discharge to get the temperature of the same package as soon as it was unloaded from the steamer. The temperatures for each line have been averaged for the season, and the results are shown in the following table:—

MONTREAL TO LIVERPOOL, SEASON 1906.

Steamship Line.	Number of Sailings with Butter.	Number of Packages Tested.	Average Tem- perature at Montreal.	Average Tem- perature at Port of Discharge.	Reduction in Tem- perature.
			Degrees.	Degrees.	Degrees.
C. P. R.....	4	19	45.5	26.2	19.3
Dominion.....	22	274	40.4	21.4	19.0
Allan.....	21	163	36.4	20.8	15.6
General Average.....			39.2	21.4	17.8

MONTREAL TO LONDON, SEASON 1906.

Allan.....	15	140	44.0	22.9	21.1
Thompson.....	26	379	40.9	19.9	21.0
C. P. R.....	1	8	46.0	24.3	15.7
General Average.....			41.7	20.5	21.2

MONTREAL TO BRISTOL, SEASON 1906.

C. P. R.....	13	179	40.0	23.7	16.3
Dominion.....	14	182	34.0	24.0	10.0
General Average.....			36.9	23.9	13.0

MONTREAL TO GLASGOW, SEASON 1906.

Donaldson ..	21	243	36.5	22.3	14.2
Allan.....	20	131	32.9	28.2	4.7
General Average.....			35.0	24.1	10.9

MONTREAL TO MANCHESTER, SEASON 1906.

Manchester Liners.....	9	33	41.2	38.8	2.4
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A comparison of the above figures with those for 1905, contained in last year's report, shows that, with the exception of the Manchester Line, there was no difference in the average temperature of the butter when delivered to the steamers at Montreal. The butter delivered to the Manchester Liners was on an average 6·8 degrees warmer in 1906 than in 1905. When a comparison is made between the temperatures at the ports of discharge, however, the averages for 1906 are much better than those for 1905, the improvement being as follows: Liverpool service 3·5 degrees lower, London service 6·1 degrees lower, Bristol service no change, Glasgow service 4·6 degrees lower. Instead of improvement the Manchester service does not show as good results in 1906 as in 1905, the average temperature at the port of discharge in 1906 being 8·4 degrees higher than in 1905. As already explained, this is partly accounted for by the fact that the butter delivered to this line at Montreal was 6·8 degrees warmer last year than the year previous.

A reference to the foregoing table shows that the Thomson Line, London service, takes first place for the lowest average temperature of butter at the port of discharge, with the fine showing of 19·9 degrees, followed closely by the Allan Line, Liverpool service, with 20·8 degrees. The Dominion Line, Liverpool service, comes third, with 21·4 degrees, and the Allan Line, London service, fourth, with 22·9 degrees. As was the case the previous season, the Manchester service makes the poorest showing, namely, 38·8 degrees. With respect to the reduction in temperature, the Allan and Thomson Line services head the list with 21·1 degrees and 21 degrees respectively.

On the whole, the cold storage services for butter provided in 1906 by the steamship lines plying between Montreal and the ports named were eminently satisfactory, and amply justify the boast that as an all around proposition the ocean cold storage service between Canada and the motherland is now the best in the world.

THERMOGRAPHS IN STEAMSHIPS.

A factor that has contributed very largely towards the marked improvement that has been shown each year in our ocean cold storage facilities is the use of the self-registering thermometer, called the thermograph. The Department first made use of these instruments in the season of 1900, when thirty thermographs were purchased. Each year since the number has been increased so that in the season of 1906-7 the Department had one hundred and eighty-two thermographs in commission, using them not only in steamship chambers and holds, but in refrigerator cars and in creamery cold storages as well. In steamships alone five hundred and fifteen records of temperatures were obtained, namely, four hundred and sixty-one records in steamers sailing from Montreal and Quebec, and fifty-four records in steamers sailing from Halifax. In the steamers sailing from Montreal and Quebec, thermographs were placed as follows:—

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Placed with.	WHERE PLACED IN STEAMSHIP.		
	Cold Storage.	Cooled Air.	Ordinary Storage.
	Times.	Times.	Times.
Butter.....	110	.....	2
Cheese.....	3	11	89
Fruit.....	16	1	51
Meats.....	4	10	1
Lard.....	1	.....	.....
Butter, meats and lard.....	36	.....	.....
Cheese, meats and lard.....	8	28	32
Frozen salmon and lard.....	6	.....	.....
Cheese, fruit and meats.....	2	10	25
Butter and poultry.....	1	.....	.....
Fruit and lard.....	1	.....	1
Apples, cheese and eggs.....	.....	.....	6
Cheese, meats and butter.....	.....	1	1
Cheese, meats and eggs.....	.....	.....	2
Apples, lumber and hay.....	.....	.....	2
Totals-.....	188	61	212

In the sailings from Halifax the thermographs in each case were placed in ordinary storage with apples.

The thermographs, which are encased in locked boxes perforated so as to admit the air, are stowed with perishable cargo in refrigerator chambers, cooled air chambers and in the ordinary holds. When the ship reaches port in Great Britain, our cargo inspector removes the thermographs just as soon as they become accessible. He takes off the charts, which are numbered to correspond with the number of the thermographs, and mails them at once to Ottawa together with a memo. giving the name of the vessel time she arrived, and date thermographs were removed. When the charts are received here such particulars as the steamer's name, sailing date, port of destination, date of arrival, date thermograph was placed, where it was placed in the ship, kind of produce it was stowed with, &c., are written on the face of each chart, and using it as a negative, six photographic copies are made, two of which are retained in the office here, one sent to the Montreal Board of Trade, one to the steamship agents, one to the chief engineer of the steamer and one to our Montreal office.

These records indicate every variation of temperature each day of the voyage and are of great assistance to the engineer in charge of the ship's refrigerating machinery, who studies them carefully, and, if any unusual variation is shown, endeavours to find out the cause so that the same thing may not occur on succeeding voyages. The engineers are, therefore, very keen to get these records, and as soon as they reach Montreal on each return voyage, they at once look for their copies of the temperature records secured on the outward voyage.

THERMOGRAPHS IN RAILWAY CARS.

Between August 10 and October 9 twenty thermographs were placed in refrigerator and ventilated cars carrying tender fruits and apples. Fourteen records were obtained in cars carrying fruit from St. Catharines to Winnipeg, three records from St. Catharines to Calgary, two records from Brighton to Montreal and one record from St. Catharines to Ottawa. Legible records were secured in each case. Besides the value accruing from an exact knowledge of the temperatures in these cars while in transit, the records were very useful in showing the length of time

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the cars were detained at the different stopping points en route. It was possible to determine this because while the car was in motion the temperature line on the chart was somewhat blurred, due to the vibration, but as soon as the car came to a standstill, the line became fine and very distinct. Copies of the records obtained in these cars were forwarded to the shippers and also to the railway concerned. In the latter case a letter was also sent pointing out the different delays in transit indicated on the chart.

A number of thermographs were also placed in refrigerator cars, carrying butter to Montreal for export, and also in creamery cold storages.

SUBSIDIES FOR COLD STORAGE WAREHOUSES.

The policy of giving financial assistance towards the erection of public cold storage warehouses in Canada was adopted by the Government during the session of 1906-7 by the introduction of the Cold Storage Bill, entitled 'An Act to encourage the establishment of Cold Storage Warehouses for the preservation of perishable Food Products.' Parliament approved of the measure and it became law without delay.

The requirements of trade in certain localities have made cold storage an absolute necessity, and in such places the revenue is sure enough to make the investment a fairly safe one, so that it needed no special inducement to secure the capital required to provide the necessary facilities.

While it may, at first glance, seem a little unfair to assist the new enterprises, even if noncompetitive, it must be borne in mind that the existing cold storage warehouses occupy the choice locations, and for that reason some inducement seems to be necessary if similar facilities are to be provided in other localities.

There is a large quantity of perishable produce handled in this country without cold storage, the value and stability of which would be much more improved by its use. Where it is possible to get along without cold storage, even if the results are unsatisfactory, the question is not studied so closely, and the improved facilities come more slowly, than is the case where the necessities are greater. It is hoped that the attention which has been drawn to the subject by the adoption of the principles involved in the Cold Storage Act, and the discussions which will naturally arise thereon, will have an important educational influence in the direction of creating a more general appreciation of the advantages of cold storage and a greater demand for such facilities. It is believed also that this process of education will result in bringing more business to existing cold storage warehouses.

The following is the full text of the Act and the regulations pertaining thereto:—

THE COLD STORAGE ACT.

AN ACT TO ENCOURAGE THE ESTABLISHMENT OF COLD STORAGE WAREHOUSES FOR THE PRESERVATION OF PERISHABLE FOOD PRODUCTS.

His Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows:—

1. This Act may be cited as the Cold Storage Act.

2. The Governor in Council may enter into contracts with any person for the construction, equipment and maintenance in good and efficient working order, of public

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cold storage warehouses equipped with mechanical refrigeration, in Canada, and suitable for the preservation of all food products.

3. The location, plans and specification of every such warehouse, its equipment, and the amount to be expended thereon, shall be subject to the approval of the Governor in Council.

4. The Governor in Council may, out of any moneys appropriated by Parliament for the purpose, grant towards the construction and equipment of any such warehouse, a subsidy not exceeding in the whole thirty per cent of the amount expended or approved of in such construction and equipment, and payable in instalments as follows: upon the warehouse being completed and cold storage at suitable temperatures being provided therein, all to the satisfaction of the Minister of Agriculture, a sum not exceeding fifteen per cent of the amount so expended; and at the end of the first year thereafter seven per cent of the said amount; at the end of the second year thereafter four per cent of the said amount, and at the end of each of the two next succeeding years two per cent of the said amount: provided the warehouse is maintained and operated to the satisfaction of the Minister of Agriculture.

5. The Minister of Agriculture may refuse to pay any part of the said subsidy if, in his opinion, the operation of the warehouse has not been of such a character as to provide for the proper preservation of such products as may be stored therein.

6. The Minister of Agriculture may order, and cause to be maintained, an inspection and supervision of the sanitary conditions, maintenance and operation of such warehouses, and may regulate and control the temperatures to be maintained therein in accordance with the regulations to be made as hereinafter provided.

7. The rates and tolls to be charged for storage in such warehouses shall be subject to the approval of the Governor in Council.

8. For the effective carrying out of the provisions of this Act the Minister of Agriculture may appoint inspectors, who shall have access to all parts of such warehouses at all times.

9. The Governor in Council may make such regulations as he considers necessary in order to secure the efficient enforcement and operation of this Act; and he may by such regulations impose penalties not exceeding fifty dollars on any person offending against them; and the regulations so made shall be in force from the date of their publication in the *Canada Gazette*, or from such other date as is specified in the proclamation in that behalf.

10. Chapter 7 of the statutes of 1897, intituled *An Act respecting Cold Storage on Steamships from Canada to the United Kingdom and in certain cities in Canada*, is repealed.

REGULATIONS.

Whereas by section 9 of the Cold Storage Act it is provided as follows:—

‘The Governor in Council may make regulations as he considers necessary in order to secure the efficient enforcement and operation of this Act; and he may by such regulations impose penalties not exceeding fifty dollars on any person offending against them; and the regulations so made shall be in force from the date of their publication in the *Canada Gazette*, or from such other date as is specified in the proclamation in that behalf.’

Therefore His Excellency the Governor General in Council is pleased, in virtue of the above cited provisions of the said Act, to make the following regulations, the same to come into force on the date of their publication in the *Canada Gazette*.

1. The Minister of Agriculture may make appointments of inspectors and other persons for the enforcement of the Act.

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2. No applications shall be considered for any cold storage warehouses except those equipped with mechanical refrigeration, nor for any place where any such cold storage already exists or where the proposed cold storage would compete directly with other establishments of the same class.
3. Applications for a subsidy under the Act must be made in the following form, which shall be known as Schedule A:—

SCHEDULE A.

No.....

APPLICATION FOR COLD STORAGE SUBSIDY.

Application is hereby made on behalf of of in the province of.....for the subsidy offered under *The Cold Storage Act* for a public cold storage warehouse equipped with mechanical refrigerating machinery, to be erected at.....

Particulars.

- Size of building in cubic feet.....
- Refrigerating space in cubic feet.....
- Number of separate chambers
- Kinds of produce to be stored
-
- System of mechanical refrigeration to be used.....
-
- Capacity of refrigerating machinery in tons of refrigeration per 24 hours.....
- Character of the available water supply.....
-
- Estimated cost of building, equipment and water supply.....
-
- Cost of site
- Will the whole building be used for the purposes of a public cold storage?
- If not, what proportion will be set aside for public use?.....
-

Attached are the following documents:—

- EXHIBIT 1, being a copy of the plans and details of the insulation of warehouse.
- EXHIBIT 2, being a true copy of the specification of warehouse and insulation.
- EXHIBIT 3, being schedule of rates to be charged.

EXHIBIT 4, sketch showing location of warehouse or proposed warehouse in regard to connection with railway lines and wharfs.

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4. The owners of cold storage warehouses in order to secure the subsidy, will be required to maintain the following temperatures therein, for the preservation of the various products mentioned.

Kinds of Produce.	TEMPERATURE.	
	Min.	Max.
Apples and other fruits.....	32	36
Butter.....		26
Cheese.....	35	40
Eggs, meats and dressed poultry..	30	34
Bacon and hams.....	40	45
Fish (frozen).....		20
Meats, poultry and game (frozen)....		20
Vegetables.....	34	38

5. Nothing in these regulations shall prevent owners of subsidized cold storage warehouses from entering into special contracts with customers for the maintenance of temperatures other than those herein specified.

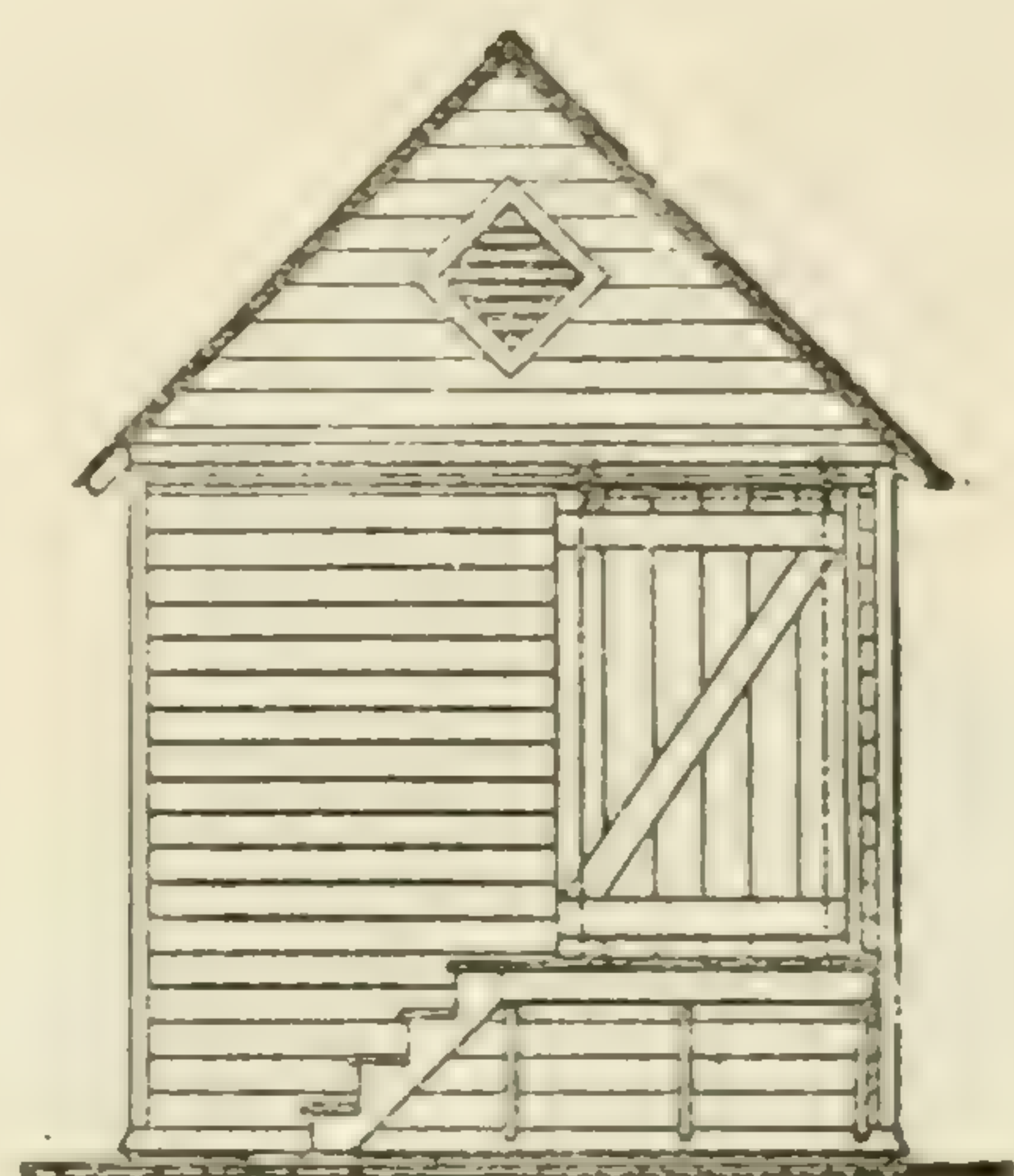
6. The first instalment of the subsidy shall not be paid until the applicant shall have presented proper vouchers for the cost of building, equipment, site and other expenditures.

7. The owners of cold storage warehouses to which the subsidy or any part thereof has been paid, may be required to make an annual report to the Minister of Agriculture in such form as may be prescribed.

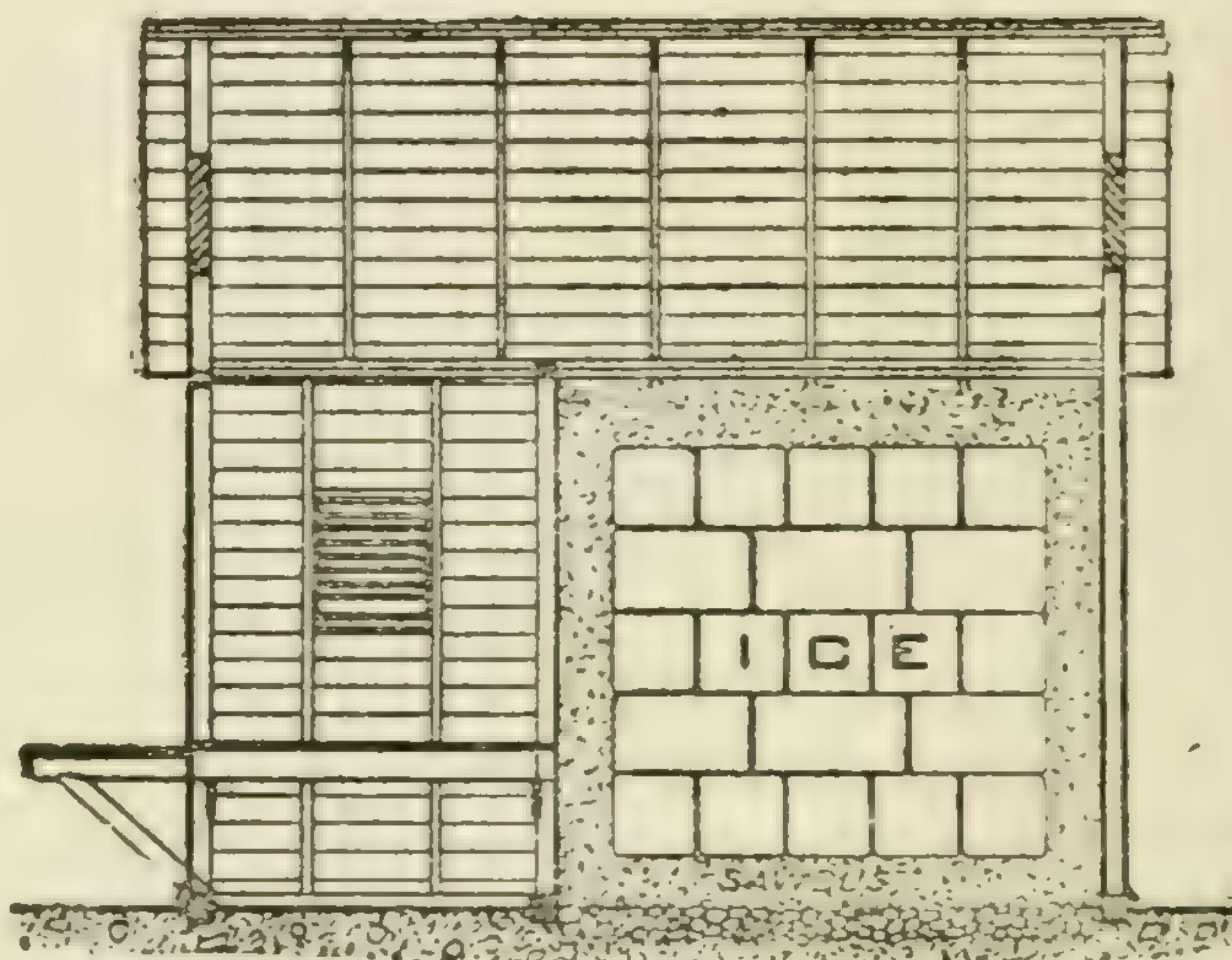
THE USE OF ICE ON FARMS.

Every farmer in whose vicinity natural ice is available should store a sufficient quantity for use during the summer months. A supply of ice is worth all it costs for the comfort it gives to the family during the heated term and, moreover, it pays for itself, if properly applied in the preservation of milk, butter, meat, vegetables and other perishable articles. The dairy farmer especially, will find in a supply of ice a great saving of labour and positive safeguard in keeping his milk during hot weather. The crudest kind of building which will keep out the sun and the rain, or the corner of a shed, will serve for the mere storage of ice if dry sawdust or marsh hay is available in which to pack it for protection against the heat. All that is necessary to do is to provide for some drainage and cover the ice on all sides, top and bottom, with about 12 inches of sawdust, hay or cut straw (24 inches of hay or straw) and protect the covering from the weather.

Those who desire to have a more complete cold storage on a small scale will find a plan and specification in the Dairy Commissioner's report for 1906.

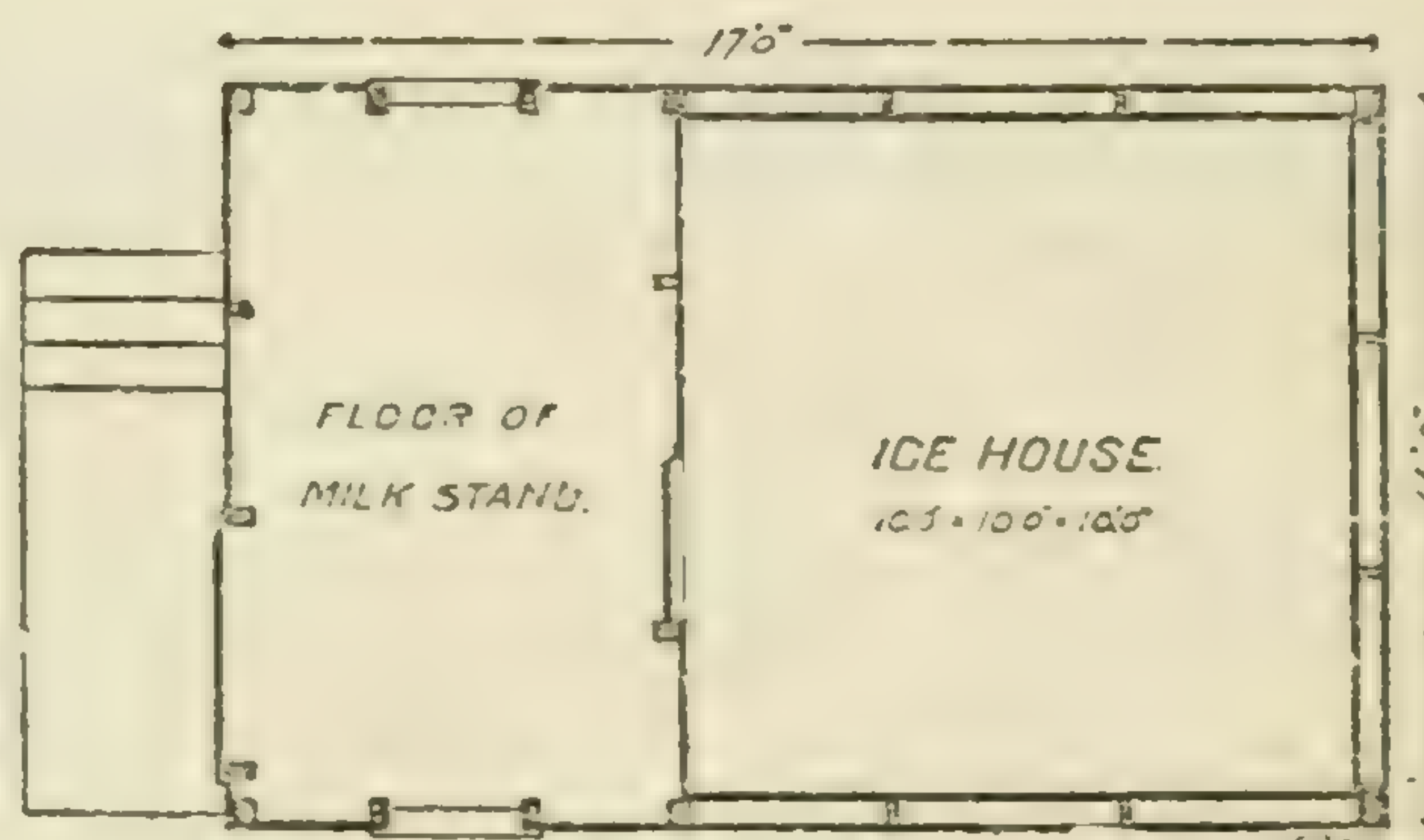
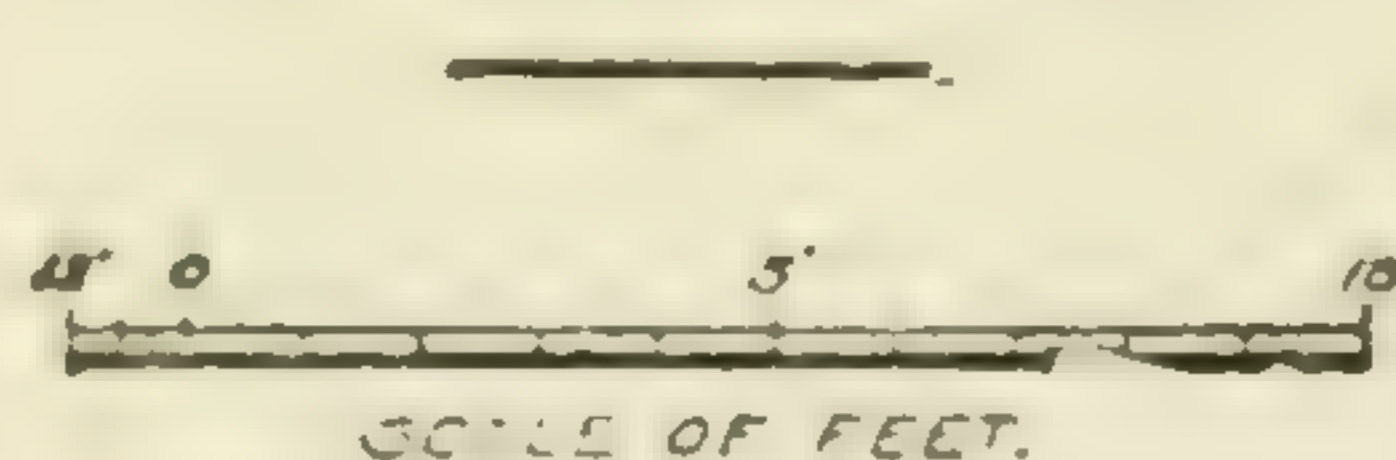


ELEVATION



SECTION

COMBINED ICE HOUSE
AND MILK STAND.



PLAN.

The accompanying plan (plate 1) shows a convenient arrangement for the storage of ice in connection with a milk stand, designed to meet the needs of patrons of cheese factories and creameries. This plan was first brought to the writer's attention by Mr. G. G. Publow, Chief Dairy Instructor for Eastern Ontario, when travelling with him through Hastings and Prince Edward counties, where many of the progressive farmers have adopted this plan. A model combined milk stand and ice house was erected on the grounds of the Central Canada Exhibition Association at Ottawa last autumn and attracted considerable attention. This arrangement which affords both protection from the weather and dust and also from animals or insects, and convenience for the cooling of milk, cannot be too highly recommended. Very great improvement would be made in our hot weather cheese if the night's milk was always properly cooled, and the saving of loss in cases where the milk turns sour before reaching the factory would amount to a very considerable sum.

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To utilize the ice for household purposes in connection with an arrangement of this kind, it would be necessary to provide an insulated ice box in which to put articles of food along with a quantity of ice from time to time. A simple arrangement, which will give good satisfaction, is to make a box in the shape of a trunk or chest, lined with galvanized iron, and divided in the centre by a partition open at the top and bottom to allow for a circulation of air between the two compartments. The ice can be placed in one side of the partition and articles of food on the other side. A box constructed as follows will give good satisfaction: One layer of matched boards covered with one inch of hair felt and finished with another layer of inch boards. That is to say, the sides, top and bottom will consist of two ply of matched boards with one layer of one-inch hair felt between. The cover should fit tightly and be provided with a cushion of some kind to make it air tight. The galvanized iron lining is necessary to prevent the dampness from affecting the wood and destroying the insulation. It is necessary to provide a drainage pipe for the melting ice, and the outlet should be trapped to prevent passage of air. If hair felt cannot be procured easily, leave a space of 3 or 4 inches between the outside and inside finish of the box and fill this space with planing mill shavings or thoroughly dry sawdust.

COLD STORAGE NOTES.

IN COLD STORAGE.

There are various methods of using ice as a refrigerant for the cooling of warehouses.

(1) *The circular systems*, in which there is communication between the cold storage room and the ice chamber to provide for a circulation of air over the ice and through the rooms which are to be chilled. The air in passing over the ice loses some of its moisture, and the ice absorbs the heat taken up in passage through the storage room. All these systems are based on the knowledge of the fact that cold air is heavier than warm air, and by a proper arrangement of the ducts the circulation of air is automatic and continuous. It is obvious that in order to promote this circulation of air it is necessary that the ice should be placed on a higher level than the rooms which are to be chilled. In some systems the ice is placed directly over the cold storage room, while in others, it is placed alongside the storage room.

In the circulation system the ice is not covered, so that the air may come in direct contact with it, but the chamber in which it is stored must be well insulated to prevent undue waste. A temperature of 40 degrees can be maintained with this system without any difficulty, providing the insulation is reasonably efficient.

(2) *The cylinder system* is another system frequently used, in which galvanized retorts or cylinders are placed within the cold storage room, and these are filled with crushed ice and salt from time to time, as may be required to maintain the refrigeration. The maximum of refrigeration is attained with a mixture of one part of salt to three parts of ice. With a sufficient number of cylinders and provision for using a large quantity of ice and salt, temperatures below the freezing point of water may easily be maintained with this system. The circulation system, being automatic, requires no labour or expense during the period of operation, but in the other system the retorts or cylinders have to be filled frequently with crushed ice, and there is the additional expense for salt. On the other hand, the ice used in the cylinder system does not require to be placed in an insulated room, but can be stored in the usual way by covering with sawdust or similar material.

SYSTEMS OF MECHANICAL REFRIGERATION.

While ice is still used for small rooms, or where low temperatures are not required, the mechanical system is the only successful one for a modern cold storage warehouse.

The ammonia compression system is the one most largely used in Canada; although a few machines have been installed which use carbonic acid gas as a refrigerating medium instead of ammonia. There are different methods of applying mechanical refrigeration to a warehouse. (1) Refrigeration may be obtained by placing expansion coils in the room to be chilled. (2) The expansion coils may be placed in a brine tank and the chilled brine circulated through pipes in the different storage rooms of the warehouse. (3) The system most generally used in Canada is known as the air circulation system, in which a circulation of air is maintained through the cold rooms by the use of fans forcing the air over the expansion coils and through trunks or ducts to the different rooms of the warehouse. This system gives a comparatively dry air, which is purified more or less in passing through the expansion coil bunker, over which a strong brine is constantly flowing. The cold brine absorbs moisture from the air and purifies it for return to the chamber where the goods are stowed.

APPROXIMATE RELATION BETWEEN SPACE TO BE REFRIGERATED AND TONS REFRIGERATION
REQUIRED.

There are so many factors that enter into a calculation of the relation between space to be refrigerated and the capacity of the refrigerating machine required, such as size of warehouse, character of the insulation, temperature of the cooling water, kind of goods to be stored, and whether for longer periods or for active storage, that it is impossible to lay down a hard and fast rule for guidance on that point. For ordinary public cold storages carrying mixed produce, the following figures are submitted as only approximate:—

Space.	Refrigeration required.
1,000 cubic feet.	10 tons per day.
30,000 " 	20 "
50,000 " 	30 "
75,000 " 	40 "
100,000 " 	50 "

For a fruit cold storage where a temperature lower than 32 degrees will not be required, the tons of refrigeration in relation to space can be somewhat reduced.

POWER REQUIRED.

For each ton of refrigeration about 1½ horse-power should be provided. That will be sufficient for pumping water and brine and driving fans, in addition to running compressor.

WATER FOR COOLING PURPOSES.

The water supply is a very important consideration in planning a refrigeration plant, as the amount of refrigeration performed is only equal to the heat taken up by the cooling water which passes over the condenser coils. It requires, roughly speaking, about one gallon of water per minute per ton of refrigeration; that is to say, a 10-ton machine would require 10 gallons of water per minute—more or less according to the temperature of the water.

The amount of refrigeration effected by any machine is only equal to the amount of heat carried off in the cooling water. The colder the water is the more effective it is for this purpose. It is not practicable to raise the temperature of the cooling water higher than about 80 degrees. It is obvious, therefore, that water with an initial temperature of 50 degrees will go twice as far as water having a temperature of 65 degrees.

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COST OF WAREHOUSES.

The cost of a cold storage warehouse, equipped with mechanical refrigeration, depends upon the class of building erected, the kind of insulation used, and to some extent on the locality and relative cost of materials. A warehouse may be constructed entirely of wood and insulated with mill shavings, at a minimum cost. Such a building may be made to serve all the purposes of cold storage, with a high degree of efficiency, until the material begins to deteriorate. A medium sized warehouse of the foregoing construction may be erected and equipped at a cost of 20 to 30 cents per cubic foot of gross capacity. Warehouses of fireproof construction throughout may cost as much as 50 cents per cubic foot of capacity. Then there are other combinations, known as slow burning construction, the cost of which will be somewhere between the two extremes. These figures are exclusive of site and water supply and are only approximate, but are given because we have many inquiries for just such information.

ALL WOOD CONSTRUCTION.

In erecting a warehouse of all wood construction, it is only necessary to provide an outer and an inner shell, as nearly as possible impervious to air and moisture, and fill the space between with mill shavings. The floors and partitions in the building are constructed in the same manner. Two courses of matched lumber, both inside and outside of the studs, with double ply damp proof paper between, will give very good results. The space between the inside and outside sheathing, which is filled with shavings, should be at least 12 inches wide and the studding should be erected on the staggered plan to save heavy material and to do away with solid timbers running from one side of the wall space to the other. For tests of insulation of this kind, and plan of construction, see Insulation Experiments, page 52, Dairy Commissioner's report for 1906.

FIREPROOF BUILDINGS.

The walls of fireproof buildings are constructed of brick, tile or concrete and insulated with non-inflammable material like sheet cork or mineral wool. This construction has the advantage of being permanent, not liable to decay in any form, and affects a great saving in the matter of insurance.

INSULATION.

Shavings.—Planing mill shavings are one of the best of available materials for the insulation of non-fireproof buildings. They are superior to sawdust, because it is almost impossible to secure sawdust in a dry condition, and therefore it heats, moulds and becomes musty, and starts decay in the walls. The heating also causes a settling of the sawdust, leaving open spaces. Shavings being taken from seasoned lumber, and from its surface, do not contain sufficient moisture to develop mould, and if well packed are not known to settle afterwards. It takes about 7 to 9 pounds of shavings to fill one cubic foot of space. They can be procured from large planing mills or large woodworking establishments, in bales, at a comparatively small cost.

Damp proof paper.—It is important to use damp proof paper of good quality in connection with shavings for insulation. Ordinary building paper is not suitable for cold storage construction and should never be depended on. The damp proof papers are made especially for this purpose.

Cork Insulation.—For fireproof construction, one of the most popular materials for insulation is sheet cork, which is applied in slabs from two to three inches thick, laid in cement and plastered with cement. For high efficiency two layers of cork are usually applied.

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Mineral Wool.—Hollow spaces in fireproof walls are sometimes filled with mineral wool.

Hollow Spaces.—Hollow spaces are not now employed for insulating, as formerly. While absolutely dead air is one of the best known insulating media, experience has taught that the air confined within hollow walls is not *dead air*, but that it circulates sufficiently to carry heat from one side to the other by convection. The filling of the wall space with a material like shavings, confines the air and prevents it from moving, although it really is the air in the interstices of the material which gives it a value for insulating purposes.

The structural walls of a warehouse are not counted upon for insulation. No matter what the construction of the building is, the insulation is a separate consideration. In the all wood construction, the combination of wall and insulation is very convenient. In the fireproof constructions, or where the walls are built of brick or concrete, the insulation is generally placed on the interior surface of the walls.

It pays to insulate well.—The problem which is before the cold storage engineer in planning a warehouse and in preparing specifications, consists in preventing the outside heat from entering the rooms, and in removing what heat is introduced by the goods brought into store, and that which finds entrance through the walls. It is always a question, therefore, as to which is the more economical, increased insulation to stop the heat from entering, or increased refrigeration for removing it. In every proposition there is a proper balance between heat stopping and heat removal, to find which requires careful calculation. The amount of insulation required depends naturally upon the difference which will exist between inside and outside temperatures. For extremely low temperatures, where sharp freezing is required, it will pay to use more insulation than in cases where temperatures suitable for the storage of fruit, for instance, will be required. All these things have to be considered in making plans and specifications for a warehouse.

EQUIVALENT OF A TON OF REFRIGERATION.

Refrigerating machines are rated according to tons of refrigeration per 24 hours. One ton of refrigeration is equal to the melting of one ton of ice, so that the cooling power of a ten-ton refrigerating machine is equal, in 24 hours, to the cooling that would be effected by the melting of ten tons of ice. For purposes of calculation, the British thermal unit (expressed B.T.U.) is used. One thermal unit is the amount of heat necessary to raise the temperature of one pound of water one degree Fahr., or to be more exact, from 39 to 40 degrees. One pound of ice in melting absorbs 142 heat units without increase of sensible heat or rise in temperature; so that $142 \times 2,000 = 284,000$. One ton of refrigeration is equivalent to 284,000 heat units. It is easy to calculate on this basis the amount of water required for cooling purposes, when one knows how many heat units can be transferred to every pound of water passing over the condensing coils. If the water flows onto the coils at a temperature of 55 degrees, and has acquired a temperature of 75, as it leaves the condensor, every pound of water will have absorbed 20 heat units, and it will take 14,200 pounds of such water for every ton of refrigeration per 24 hours, or almost exactly 1 gallon per minute per ton of refrigeration per day.

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